The Builder.

VOL. LX. No. 2207. SATURDAY, FEB 21 1891.

ILLUSTRATIONS.

Design for Staircase for a Large Town Mansion (Tite Prize Design, R.I.B.A.), by Mr. A. Mackintosh :—
Ceiling Plan ..... *Single-Page Ink-Photo.*
Perspective View ..... *Single-Page Ink-Photo.*
Cross Section Showing Detail ..... *Double-Page Ink-Photo.*
Longitudinal Section ..... *Double-Page Ink-Photo.*
Byzantine Architecture : Illustration to Professor Aitchison's Royal Academy Lectures :—
Plan of the Imperial Palace at Constantinople ..... *Double-Page Photo-Litho.*

Blocks in Text.

Plans of Mr. A. Mackintosh's Tite Prize Design for a Staircase to a Town Mansion ..... Page 149
Ventilation and Warming: Diagrams illustrating Paper in "The Student's Column" 154

CONTENTS.

A New Dictionary of London 139
Notes 142
Byzantine Architecture. IV.—By Professor Aitchison 144
Royal Institute of British Architects 147
The Architectural Association Visits 148
Design for a Staircase for a Town Mansion 149
The Imperial Palace at Constantinople 149
Lectures at University College 149
London County Council 150
Architectural Societies 150
Competitions 151
Free Lectures to Artisans at Carpenters' Hall 151
Books: Mattieu Williams's "Chemistry of Iron and Steel Making" (Chatto & Windus); A. M. Bey's "Outlines of Ancient Egyptian History" (Gilbert & Rivington); H. H. Gibbs' "Account of High Altar Screen in Cathedral Church of St. Alban's" (Gibbs & Bamforth) 151
Adjoining Owners under Metropolitan Building Act 152
Proposed New Concert Hall, Langham-place 153
Student's Column 153
Obituary 154
General Building News 154
Foreign and Colonial 155
Miscellaneous 155
Meetings 156
Recent Patents 157
Some Recent Sales of Property 157

*A New Dictionary of London.**

THE latter part of last year was signalised to an unusual degree by the publication of topographical books dealing with London. These were marked by varying merit, and most of them were plentifully illustrated. With one or two exceptions, the several texts had plainly enough been "written up" to the pictures, which is seldom a satisfactory method so far as the earnest reader is concerned; and upon that account the books did not constitute, upon the whole, a considerable contribution to an advanced knowledge of their subject. The Rev. W. J. Loftie's book,—"London As It Is," with illustrations by Mr. Wm. Luker, jun., — is, we understand, rapidly drawing near to its completion. Meanwhile we can make ourselves quite content with the well-ordered stock of information contained in the three portly volumes which have just been brought out by Mr. Wheatley. There are, we should imagine, very few amongst our readers who need to be reminded that Mr. Henry B. Wheatley brings to his task qualifications and credentials of no ordinary kind. The author of "Round About Piccadilly," of "Samuel Pepys, and the World He Lived In," and of the article upon "London" in the "Encyclopædia Britannica," the life-director of the Topographical Society of London, and a past editor of the *Antiquary*—to say nothing of his proved attainments in other fields of literature and art—might, *à priori*, be deemed capable of successfully accomplishing so large an undertaking. This was, in effect, to carry down to our own present day the late Peter Cunningham's "Handbook of London," one of Murray's well-known series. But it is a handbook no more. A compilation in three volumes, of large demy-octavo size, containing in all 1,774 pages, and weighing nearly 10 lbs., forms, at first sight, a portentous outgrowth from the convenient book, familiar by its size and colour, and having but 602 pages, which, published in 1850, formed the second and enlarged edition of Cunningham's handbook. The latter writer adopted a plan which we believe was first used by Elmes—that of arranging the names of buildings, streets, places, &c., in alphabetical order. This rendered his book very useful for purposes of easy reference within doors; and equally serviceable for outdoor use to those who are not quite strangers in the town. We ourselves have on more occasions than one met parties of visitors, with their Murray in hand, yet rather at a loss to know exactly "where they were." In this respect we have found the small yellow volume, issued yearly in the late Mr. Herbert Fry's name, to be well adapted for the ordinary wants of visitors, by reason of its directions as to the situations of the places which mostly are sought after, and its sets of maps *à vol d'oiseau*. Mr. Augustus J. S. Hare's "Walks in London," which has attained to the honour of several editions, is a pleasant companionable book, beyond question. But it is so untrustworthy, and so full of inaccuracies, which the careful observer will at once detect, that we should hesitate to recommend it, when many a better hand-book can be found.

No one man in a single lifetime could hope to write *de novo* the History of London. We have seen it attempted lately by Mr. Loftie, whose two volumes were published under that title, in 1883. His lively style, the fresh maps and plans, his frequent choice of a new standpoint whence to enter upon an old topic, all these attractive qualities earned for his "History" a well-deserved popularity. Nevertheless, a more sober judgment compels us to the opinion that that author's plan, well-conceived as it undoubtedly was, failed in the execution. He is also author of the volume "*London*," being the first of the series of Historic Towns," edited by Professor Freeman and the Rev. W. Hunt, which was reviewed in our columns on January 7, 1887. His ambitious project still remains unperformed. In resuming the task of Cunningham's hand-book, and in extensively enlarging upon its scope and original contents, Mr Wheatley stands self-confessed as a rich harvester on the same ground wherein many others have assiduously toiled before him. The magnitude of the debt does in no way detract from the individual merits of the debtor. The precedent labours of Stow, Hatton, Noorthouck, Strype, Maitland, Pennant, Malcolm, Newcourt, Allen, together with a score of their fellows, are, by the very nature of the case, absolutely necessary to a compilation that is cast into the present shape. Nor should we neglect, when recalling the valuable work of past writers, those who severally concentrated their efforts upon closely defined localities, or upon particularly chosen themes. It is in no spirit of disparagement of more recent endeavours that we premise that any student can ill afford to leave unopened many volumes (all of them probably not always ready to his hand) if he is careful to gather authentic materials, yet whose load, in the end, will perhaps prove overwhelming. At this moment we call to mind such books as those of Neale and Dean Stanley (Westminster), Faulkner (Hammersmith, Chelsea, Fulham, &c.), Palmer (St. Pancras), Cox (St. Helen's, Bishopsgate), Park (Hampstead), Robinson (Hackney), Ellis (Shoreditch), Allen (Lambeth), Dugdale and Dean Milman (St. Paul's), W. Herbert (City Companies and Inns of Court and Chancery), Rowland Dobie (Bloomsbury and St. Giles), Lewis, Tomlins, and Nelson (Islington), Wilkinson, J. T. Smith (Antiquities of Westminster, &c.); or of W. Howitt (Northern Heights), Elmes (Wren's Life and Times), Britton and Pugin, George Godwin (The City Churches), Leigh Hunt (Kensington, &c.), and T. C. Croker (A Walk from London to Fulham). The list is well-nigh endless; yet these are amongst the authors whose works stand out eminent, and who add generously to the common fund.

Within the last fifty years or so our knowof London antiquities—very different from antiquarian enthusiasm—has made substantial progress. Our own generation enjoys the great advantage of having lived to profit by the learning and research of several distinguished men. No one will deny to Mr. W. Rendle the title of "the historian of Southwark." We are enriched by the investigations of General Pitt-Rivers, Mr. C. Roach Smith, and Mr. J. E. Price in the matter of Roman remains; of Mr. W. Ralph Douthwaite amongst the Gray's Inn archives; of Mr. Maxwell Lyte amongst

* "London Past and Present: its History, Associations, and Traditions." By Henry B. Wheatley, F.S.A., Based upon the handbook of London by the late Peter Cunningham. London: John Murray. 1893.

the manuscripts in the cathedral church of St. Paul. We have gained, moreover, Mr. Riley's "Memorials of London and London Life," whilst Dr. Reginald R. Sharpe follows with his lordly volumes (1889-90) by way of a calendar of wills proved and enrolled in the Court of Husting, London, 1258-1688. In September, 1889, the Court of Common Council voted a maximum sum of 1,000*l.* to be expended in the production of a new history of the city of London, derived, as far as may be, from the civic archives.

Mr. Peter Cunningham died on May 18, 1869. His brother, Colonel Francis Cunningham, undertook to prepare another edition of the handbook, but made little real progress therewith, and, after his death, the correction and completion of the book devolved upon Mr. Thorne. Mr. Thorne died before things were ready for the press, and his MS. was entrusted to Mr. Wheatley for revision previous to its publication. The result from this delay is a set of volumes which we may fairly describe as an historical dictionary of London. Discarding most of the perfunctory portions of Cunningham's own introduction, he gives to us instead a condensed history of the foundation and growth of the city. Those who approach the subject for the first time will perhaps be disappointed to find that even now so little can be said with any certainty about its pristine origin. We must, of course, repudiate the inventions about Brute and his new Troy set up in Geoffrey of Monmouth's romance. "Myth," writes the late J. R. Green, "legend, tradition, the classical pedantry of the day, the Welsh dreams of future triumph over the Saxon, the memories of the Crusades and of the world-wide dominion of Charles the Great, were mingled together by this daring fabulist in a work whose popularity became at once immense."* Albeit, it inspired one of Spenser's sounding couplets:—

> "For noble Britons sprong from Trojans bold,
> And Troy-novant was built of old Troyes ashes cold."

and has furnished to a living Laureate some themes for the lofty lessons of courtesy and true nobility that run through his "Idylls of the King." After quoting the *Liber Albus*, and its referring of all good things in London to ancient Great Troy, Mr. Wheatley says:—

> "Now scepticism has gone to the opposite extreme, and denies the very existence of a British London. The name, however, seems to show that there must have been some early settlement here, for whatever the etymology may really be, no one disputes that it is of Celtic origin. . . . We need not dispute the existence of a Britsh settlement before the Roman Conquest."

The commonly-received, and quite possible, etymology lies in the British *Llyn-Din*, or Lake-Fort, the stronghold, on the rising ground eastwards of the wall-brook, may be, that Julius Cæsar wrested from Caswallon, the scene one hundred years later of Boadicea's victory, and of her quickly following overthrow by the legions of Suetonius. Our earliest conquerors made good their stand amongst us by the building, before the end of the fourth century, of an encompassing wall, the first London wall, which, as Mr. Loftie aptly reminds us, was thrown up after the conversion of the West, and therefore around a Christian city. But after an interval of 365 years the Romans had to hasten away from our shores to encounter troubles that threatened them nearer to home, and for a space of two centuries "there is perfect darkness as to the state of London [save for the flight thither of the men of Kent from Crayford before Hengist and Horsa in 457] and we are left entirely to conjecture as to its history." In the end Ælfred succeeded in vanquishing the Danes; he re-built the wall and makes his son-in-law, Æthelred, its lord. The Saxons, in their turn, are forced to yield to the Norman host, whose leader signalised his conquest by the planting of his dominant *Arx Palatina* in the East, and by the re-building of Æthelberht's old St. Paul's. By the palace near to the western Minster his son builds a noble hall (so wantonly defaced in our own day), and there in Henry VII.'s reign the Law Courts of England were fixed. Thenceforward we may justly regard Westminster, declared "a city" *temp.* Henry VIII., as being the actual capital of the kingdom, Canterbury being its metropolis—the place where the sovereign is crowned, lives, and deals out justice; a continuity still unbroken, for the new Courts of Justice, excepting portions of the eastern wing, and our royal palaces lie within the bounds of the western city. So the chronicle runs on, more steady and better known; whilst depressing epochs of revolt and civil war, of fire or pestilence, of confiscation and persecution pass over its face. But London emerges through all supreme, and we may trustingly look forward to a better rule of economic municipal control. Mr. Wheatley concludes his introduction—

> "The Londoner will, as an archæologist, regret the many interesting relics of the past which have been swept away; but, as a patriot, he will rejoice at what has already been done for the improvement of the sanitary condition and the architectural appearance of the greatest city in the world."

And, in sooth, great, mighty, and terrible, as De Quincey called it, it had already been, in outward form at least, one of the most beautiful of cities. Its rivers once flowed clear, its stones were once clean, its grass was green. We can figure to ourselves the countless rivulets and streams, their banks dotted here and there with mills, whose clacking sounded so delightfully to the ear. The spring-heads and wells whereunto the citizens and apprentices would resort when bank-holidays were not—all such charms within short distance from its walls, are indicated by Fitzstephen in his preface to his life of his master, St. Thomas of Canterbury, *temp.* Henry II. It has been estimated that at one time nearly one-third of the entire site was covered with churches and monastic buildings with their precincts. From their midst rise aloft the towers and spires of St. Laurence Pountney, St. Mary, Summers-hythe (Somerset), St. Michael, Cornhill, St. Mary (Elsynge), Spital, St. Dunstan-in-the-East, St. Dionis, St. Mary-le-Bow, and St. Paul. Around them the large conventual churches of St. Katharine-by-the-Tower, All Hallows, Barking; St. Clare (Minories), Crutched Friars; the Augustinian Friars, Grey Friars (Newgate-street), Black Friars, White Friars, and St. Bartholomew-the-Great, with the Priories of St. Helens (Bishopsgate), Holy Trinity (Aldgate), and St. John and St. James (Clerkenwell). On the Bridge is St. Thomas's Chapel, and by the Surrey side we see St. Olave and St. Mary Overy.*

As touching the relics, Mr. Wheatley's list of those preserved in the Guildhall Museum is very meagre. Amongst the more recent additions the following are worthy of being noticed. The carved lion from Holywell-street, Strand (to which we referred in a "Note" on October 26, 1888); a child's coffin cut out from the solid chalk, found laid over a Roman cinerary urn, 12 ft. below ground, at the west end of St. Olave's, Old Jewry; the two hour-glasses and figure of Time (all carved in wood) from St. Giles's, Cripplegate (1888); a whale vertebra dug up in the Minories (1885); a carved female head, Paternoster-row, with date "1677"; another carved head, grotesque, from Spital-square (1890); the so-called "pill" sign from the old "Maidenhead" behind Bow Church (see the *Builder*, Dec. 28, 1889, and Jan. 4, 1890); the two figures, by Cibber, that rested over the gates of Bethlehem Hospital, Moorfields; the sign of the Bell from Knightrider-street; the "Bull and Mouth" sign, Angel-street, and the trophy to Milo the Crotonian, Queen's Hotel, St. Martin's-le-Grand; a fossil vertebra and some stone cannon-balls from the Tower Bridge works; with a pair of huge fossil tusks from Wapping.

All lovers, English and American alike, of Elia, will be glad to learn that Mr. Wheatley is not quite accurate in saying that Crown Office-row, Inner Temple, has been rebuilt. We are authoritatively informed that Nos. 4, 5, and 6, to the west, were pulled down in 1859, and re-erected by 1865, but Nos. 1, 2 (Charles Lamb's birthplace), and 3, are still standing. The row was built in 1737—which date is inscribed on the east wall of No. 1—by name of the "New-building opposite the garden-wall." The garden-wall is now replaced with a railing, and the gates, bearing date "1730," were, about twenty-five years ago, removed a few yards westwards to their present position immediately opposite to No. 2 staircase. We may add that the "Samuel Salt" of Lamb's essay, "The Old Benchers of the Inner Temple," is not a mythical personage. Mr. J. H. Milton, of the Treasurer's office, enables us to quote this record:—"13th May, 1768. At this Parliament: It is ordered that Samuel Salt, Esquire, a Barrister of this Society, aged about Fifty, be and is hereby admitted for his own life, to the benefit of an Assignment in and to All that Ground Chamber, No. 2, opposite the Garden Wall in Crown Office Row. He the said Samuel Salt having paid for the Purchase thereof into the Treasury of this Society, the sum of One Hundred and Fifty Pounds." Dr. Johnson-buildings, S. Smirke, R.A., architect, has replaced the chambers, in Nos. 1 and 4 of which respectively Dr. Johnson and Lamb lived. We are also informed that the staircase, with the doorway and its hood, were presented by the Benchers to the Crystal Palace Company in November, 1857.*

The account of Lamb's "cottage in Colebrooke-row, Islington," whither he and Mary removed in the summer of 1823 from 20, Russell-street, Covent-garden, needs to be re-written. Once more "Colebrooke Cottage,"—the name "Elia" was struck out more than twelve months ago,—it stands, four stories high, at the northern end of Camden-terrace. It is no longer detached, for the three adjoining houses were built nine years since. The garden is converted into Webb's stable and van-yard. A woodcut in the *Illustrated London News* of January 6, 1849, shows the house as in Lamb's time, with the stone steps turning to the left (they are now turned to the right), from which Dyer walked into the New River, and which Lamb himself must at times have found to be rather awkward for ascent. The palings, drawn in the wood-cut, are said to have been put there by Lamb; but the tree by the riverside has gone. The two windows of the dining-room (front) are made into one, and the three windows of the "lightsome drawing-room" (Lamb to Bernard Barton, September 2, 1823) into two. "Colebrooke-Row, 1768," is inscribed on a tablet in the wall of No. 32, on the opposite side of the way. The cottage is visited constantly by Americans. So again, it should have been stated that No. 7, Little Queen-street, where Mary Lamb, in a fit of insanity, killed her mother, has, together with Nos. 6 and 8, long been covered by Holy Trinity Church. No. 7 stood over against Gate-street. No reference is made, under St. Botolph's, Aldgate, to De Foe's marriage. In the *Athenæum* of August 23, 1890, we read that the licence allegation lies in the Vicar-General's Office—"28 December, 1683, Charles Lodwick, of St. Michael, Cornhill, applies for Daniel Foe of the same parish, 24, and a batchelor, marchant [an earlier date than that given by Mr. Wheatley for De Foe's hosiery shop in Freeman's-yard, Cornhill], and Mary Tuffley, of St. Botolph, Aldgate, 20, spinster, with consent of her father. At St. Botolph Aldgate, St. Giles Cripplegate, or St. Laurence Jewry." The St. Botolph register has this entry: "Jan. 1 1683 [O.S.] Daniel Ffoe, batchellor, and Mary Tufflie, spinster, married by Mr. Hollingworthy." If the age of De Foe given in the allegation is correct, it goes far to determine the vexed question of the year of his birth. Strange to say, Mr. Wheatley does not give the name of Peter Cunningham himself in

* "A Short History of the English People," 1876, fo. 115.

* Compare with Mr. H. W. Brewer's view (*temp.* Henry VIII.) in the *Builder* of January 7, 1888.

* See the cut in the *Builder*, September 12, 1857.

the list of distinguished *alumni* of Christ's Hospital. We are authoritatively told that Peter, son of Allan Cunningham, citizen and patten-maker, was a "blue" during the interval 1825-31. Nor that of Louis Cavagnari, the hero of Cabul, whose bust was unveiled in the court-room nine years ago. Similarly, under Westminster school, the names of Cockerell and Gwilt, architects, are absent, with those of Jeremy Bentham, Dr. Mead, Sir F. Burdett, Sir Elijah Impey, Toplady, Samuel and Charles Wesley, Admiral Rous, Bonnell Thornton, Lord Peterborough, Robert Harley, Earl of Oxford; Lord-Chancellor Jeffreys, Browne Willis (antiquarian), Field-Marshall Lord Lucan, Henry Fynes Clinton, William Francklin (Orientalist), and E. Gunter (mathematician), died 1626. Vincent-square has been the playground for years past. We don't quite see why. Ashburnham House, in Little Dean's-yard, in the garden of which is part of the refectory wall, is spoken of as being "now a prebendal house." It passed to the school in 1881, in fee simple, in pursuance of the Public Schools Act, 31 & 32 Vict., cap. 118, and has been used for class-rooms ever since. Mr. Turle's house was next adjoining, over the "dark cloisters," and was pulled down in 1883. For these two houses—the changes evoked a considerable controversy at the time—a sum of 6,000*l.* was paid by the governing body to the Ecclesiastical Commissioners, with another sum of 4,000*l.* for No. 18, in Great Dean's-yard. From out of these moneys were built the two new canon's residences in the old Infirmary Garden.

Inasmuch as a Royal Commission is inquiring into the interment or commemoration of illustrious men in Westminster Abbey, we may state that Mr. Wheatley does not bring his book up to date in these respects. We fail to find that he records the burial of Lady Augusta Stanley (1876), Dean Stanley (1881), and Charles Darwin (1882); of Robert Browning (on December 31, 1889, by Chaucer's tomb), G. E. Street (1881), and Wm. Spottiswoode, P.R.S. (1883). Moreover, busts will be found in the Abbey in memory of Coleridge, by H. Thornycroft (7 May, 1885); Archbishop Tait, by Armstead (November 13, 1884); Burns, by Sir John Steell (March 7, 1885); Longfellow, by Mr. Brock (1884); Sir G. C. Lewis (1864); Macaulay (1865); Earl Russell (1880); Cobden (1866); Rev. F. D. Maurice (1872); Lord Lansdowne (1873); Sir Jas. Simpson (1875); Sir Chas. Lyell (1877) and Bishop Thirlwall (1877); George Grote (1872); Charles Kingsley (1875); and medallions in memory of Professor Fawcett, the beautiful work of Mr. A. Gilbert, and erected by the nation (1886), Darwin (1887), W. E. Forster (1888), Sir Henry S. Maine (1889), Balfe (1882), and John Wesley (1876). To one or two of these would apply the saying of Dr. Gregory, repeated by Dr. Johnson, that he had "seen erected in the church a statue of that man [Milton's bust, 1737] whose name I once knew considered [by Dr. Sprat, dean] as a pollution of its walls." Dean Stanley's monument and effigy (1884) are the joint work of Mr. J. L. Pearson and the late Sir Edgar Boehm, R.A. There are statues, too, of Lord Shaftesbury, the philanthropist, by Boehm (1888); Lord Beaconsfield, by Boehm (April 19, 1884); and Lord Stratford de Redcliffe (1884). Lord John Thynne's monument (1885) is in the choir, north aisle. He was the last resident in Ashburnham House. A medallion to James Turle, organist, was set up in the west cloister in 1884. The memorial window to Chaucer is cited, but not those to Robert Stephenson (1862), Joseph Locke (1863), I. K. Brunel (1865), Sir C. W. Siemens (1884), and Richard Trevethick (1888), engineers; to the poets Herbert and Cowper, as old Westminster boys, by Mr. Childs, of Philadelphia (1876); V. Novello (1863), and Jas. Turle (1882), musicians. To the John Conduitt monument has been added a memorial of Jeremiah Horrocks, who, when only twenty years of age, computed and observed with greater accuracy than by any others the transit of Venus which occurred on December 4, 1639. That marvel amongst astronomers died two years afterwards. We notice that Mr. Wheatley repeats Cunningham's transcript of the words on Edward I's. tomb; even Stanley does not give them correctly; by writing "Scotorvm" instead of "Scottorvm;" and in the Nightingale monument it is the left, and not the right, arm and hand of Lady Elizabeth (not Mrs.) Nightingale which "are considered by sculptors as the perfection of fine workmanship." She was a daughter and co-heir of Washington, Second Earl Ferrers, and sister of Selina, Countess of Huntingdon. She died in 1731, and the monument, erected in 1758, is really to her husband, J. Gascoigne-Nightingale, who died in 1752, at Enfield.

Apropos of the statement that Henry Cary, translator of Dante, was laid in an unmarked grave, we may refer Mr. Wheatley to a letter printed in our colums on February 8, 1890, containing a copy of the inscription made by our correspondent. To the three or four sixteenth-century booksellers whose names are given under "St. Paul's-churchyard," we will add those of the celebrated printer, John Day, who removed hither, *circa* 1575, from "over Aldersgate beneath St. Martyn's," *circa* 1575; John Reyner, printer and bookbinder, at sign of the St. George, 1527-1544, whose portrait and memorial-window were in old Stationers' Hall, and who was succeeded here by Cawoode, his apprentice; and Henry Penwell, at the Trinity, 1518-1539, printer and bookseller, to whom Wynkyn de Worde bequeathed 4*l.*, value of printed books. We believe we are correct in saying that Mr. A. Waterhouse, R.A., and not (as stated) Mr. Barnes Williams, was architect of the new St. Paul's School, opened on July 23, 1884, by Lord Selbourne.

Referring to the scheme for decorating the dome of St. Paul's with mosaic, we read that "little has since been done" by a subcommittee appointed *ad hoc* in or soon after 1877. But, as it happens, we know that a good deal has been done. Mr. W. E. F. Britten has sent to Signor Salviati's (Venice) two full-sized working cartoons of SS. Mark and Luke for the pendentives over the entrance into the choir, which will be executed in mosaic. Of the four greater prophets, from cartoons by Mr. Rubens Townrowe, after the late Alfred Stevens's designs, Isaiah was placed more than ten years ago, and Daniel will be set up within a month; St. John, by Mr. G. F. Watts, R.A., was fixed about a year since; and, with that painter's concurrence, Mr. Britten will make some improvements in the drapery and colour of the St. Matthew.

There is an odd mistake of omission or commission, or both, in regard to the model of the first Greek cross design for St. Paul's, which is referred to as "now in the South Kensington Museum." There may be some model of the design there which we do not recollect; but the model *par excellence* is, and has been for years, in a room in the cathedral, though not accessible to the general public. The choir apse is in course of decoration by Messrs. Bodley & Garner, architects; but this is not a happy subject. Here, too, we notice some omissions from the record of more recent burials, including those of Sir Edwin Landseer (1873), J. H. Foley (1874), Sir Henry Bartle Frere (1884), George Cruikshank (1878), Lord Napier of Magdala, with the highest military honours, on January 21, 1890. On May 18, 1888, the remains of Maurice Greene (musician) were removed hither from St. Olave's, Old Jewry. He had been organist at St. Paul's from 1718 to his death in 1755. Suett, the actor, who had been of the choir as a boy, was buried in the churchyard. Under "Whitehall" is a reference to "the lead [*sic*] statue of James II. behind Whitehall." We do not know of any authority for saying that this figure, the most beautiful of its kind in the town, is of lead, nor does an examination we have made of the metal corroborate the statement. Moreover, in Sir John Bramston's Autobiography, first printed by the Camden Society in 1845, is "On New Year's Day, 1686, a statue in brass was to be seen (placed the day before) in the yard at Whitehall, made by Gibbons, at the charge of Toby Rustick [Rustat], of the present king, James the 2nd." Mr. Wheatley repeats Cunningham's mis-statement that Trinity Church, Minories, is the church of the Priory of Holy Trinity, founded by Queen Matilda in 1108. That priory, one of the richest in England, was by Aldgate. Its church remained to Stow's day,—he says "it seemeth to be very old,"—and, having served for the united parishes of St. Mary Magdalene, St. Michael, St. Katharine, and the Trinity, is represented by St. Katharine Cree (or Christ) church, which is on the priory burial-ground. Now, under "Minories," Mr. Wheatley quotes Stow, and apparently with approval, as did Cunningham:—

"An abbey of nuns of the order of St. Clare, called the Minories, founded by Edmond, Earl of Lancaster . . . . in the year 1293. . . . . In place of this house of nuns is now built divers fair and large storehouses for armour and habiliments of war, with divers workhouses serving to the same purpose: there is a small parish church for inhabitants of the close called St. Trinitie's [Trinity Church in the Minories]."

Clearly, Stow knew the two churches, whose positions are indicated in Mr. H. W. Brewer's view, which we published January 7, 1888.

The tower, at any rate, of St. Mary Somerset, Upper Thames-street, has *not* shared the fate of the church. There it yet remains; having stood at the church's south-western corner. It is in five stages; with a square panelled pedestal, and urn, at each angle, and in the centre of each side a similar pedestal, carrying an obelisk, also panelled, and with a ball on top. The obelisks rise to a greater height than the urns. The great quadrangle of St. Bartholomew's Hospital, begun by James Gibbs, is said to have been the first instance of the use of Bath stone—it was recased in 1851 by Hardwick. The house in Kensington, wherein Thackeray wrote "Vanity Fair" is in Young, not "York"-street. We find no reference in the index to Mozart, or in the text to Cecil-court, St. Martin's-lane (recently demolished), where he and his sister lodged with their father on coming to England in April, 1764; or to No. 45, High Holborn, where Haydn had his first lodgings in London — pulled down about nine years since for the First Avenue Hotel. Nor does the author seem to be aware that the great interest attaching to the old Opera House in the Haymarket is that it was the house in which Handel's operas were produced during the great period of his operatic success, when the house was so crowded that ladies and gentlemen were requested to come without their hoops and swords respectively. There is a watercolour drawing of the house in the Crace collection. To the account of Lord Cochrane's escape from the King's Bench Prison, whither he "was committed for complicity in certain Stock Exchange frauds"—the De Berenger frauds—a note might be added that eighteen years later the gallant commander's innocence was established, and his honours of knighthood restored. See G. Lathom Browne's "Narratives of State Trials" (1882). Whitcomb-street is correctly described as [extending from] "Pall Mall East to Coventry-street, originally *Hedge-lane*." But on another page we read: "Hedge-lane, now Dorset-street . . . . leading from Pall-Mall East to Coventry-street." The fact is Dorset-*place* was incorporated with Whitcomb-street a few years ago. Prince's-street, now merged into Wardour-street, was formerly part of Hedge-lane. At the corner of Prince's (now Wardour) and Richmond-streets, south-west end of the latter, was a house,—pulled down in June, 1885,—which was believed to have been inhabited by Nell Gwynne. Under "King's-square-court, Dean-street, Soho," is cited Sir Isaac Newton's acknowledgment, March, 1693, of the receipt of a "box of rulers" from Mr. Fatio, in King's-square-court, near Soho-square, with the remark, "This is worthy of note as preserving

for a century the old name of Soho-square." The square was built in 1681, and the citation points rather to an early adoption for it of the name "Soho" alone. In Shadwell's play of "The Scourers" (1691) the name Soho-square occurs thrice; but the square was also known as King's-square for about sixty years later. In the index to the Parish Clerks' "New Remarks of London" (1732) is: "King's-square, *vulg. called* Soho-square, near Compton-str." In No. 2 of "The Spectator," March 2, 1710-11, Steele makes Sir Roger lodge in Soho-square. According to the rate-books of St. Anne's, Soho, we find that a Lady Coverley was living there in 1707. The then inhabitants were rated thus: — Monmouth House (vacant), Lady Cavendish, 2*l.*; Earl Berkeley (Charles, second earl), 2*l.*; Earl Carlisle (Charles, third earl), 5*l.*; Lady Ffauconbridg, 4*l.* 3s.; Sir Orlando Bridgman, 1*l.*; Sir Richard Onslow, 1*l.*; Countess Leicester, 1*l.* 13s. 6d.; Lady Coverley, 8s.; Lord Geo. Howard, 1*l.* 5s.; Sir John Newton (head of Sir Isaac Newton's family), 1*l.* 13s. (again in 1716); and Sir Cloudesley Shovell, 4*l.* The Soho quarter, so greatly changed by the making of Shaftesbury-avenue and Charing Cross-road, was singularly rich in street tablets: some that may be worthy of record—"Crowne-street, 1775,"—on wall (in 1885) of No. 85, at south-east end, junction with Moor-street; "Crowne-court in Poltney-street, 1707," at north-east corner of east side of the court, pulled down; "Nassau-street in Whethin's Buildings, 1734," No. 12, at south-west corner, junction with Gerrard-street, "Edward-street, 1686," and "Wardour-street, 1686," at junction of those two streets. Wishart & Lloyd's tobacco and snuff shop was at 21, Coventry-street, when that side of the street was pulled down for widening the thoroughfare, *circa* 1881, and not, they tell us, in the Haymarket. The corner shop was Last's, a trunk manufacturer's. Wishart's, it may be added, was a favourite resort of Jacobites in the earlier half of the eighteenth century. Their figure of the Highlander, one of but two or three in London, was destroyed on the removal to the Haymarket—west side. Hard by is Fribourg & Trever's fine old shop-front, with which should be compared the shop-front in Brewer-street, corner of Lower James-street.

The contents of such a work as this cannot be mastered in a day. In glancing through its pages we see, it is true, omissions and mistakes, and do not find the topographical particulars as full as we expected. Some changes in the names of streets, &c., are unrecorded, as well as the repair or re-building of certain churches. Yet these, and the like to them, are small blemishes, many to be best corrected by observation upon the spot. Though we miss the easy flow of a continuous history we think that, despite the rather rigid and unsympathetic treatment involved, the author is wise in adhering to the former arrangement. It is, indeed, a noble performance, and the gratitude of all is amply due to Mr. Wheatley for writing so great a book upon so great a theme.

NOTES.

WERE it not for the combination which exists between the various labour unions, the difficulty at the Cardiff docks would have been at an end,—most of the strikers' places being now filled. But it would appear that it is not to be settled on its merits, the affiliated unions being expected to come out in order to force the employers to re-instate the self-discharged men,—which, as the places were kept open for a long while, the employers decline to do. Sir W. Lewis (Lord Bute's agent) in the course of an interview with Mr. Mann, declared that there was nothing left to negotiate about, but the strikers subsequently expressed a determination to "fight to the last," —though, if there is nothing to negotiate about, there cannot be much to fight for. It appears to be essential for the restoration of peace that all coercion and boycotting (or whatever is to be the name of a system imposing restraints upon freedom of contract), shall be *really* abandoned by both sides. As the men claim that the shipowners should exercise strict neutrality in the selection of crews, they must abandon the absurdly illogical practice of throwing up their employment whenever it brings them side by side with men who have not joined their union. This is so far recognised by their leaders that a notice was issued on Tuesday night withdrawing a manifesto dated Dec. 5, the carrying out of which was bound to cause friction and difficulty. This manifesto called upon the men to "refuse to do any work upon the boats of Messrs. Shaw, Savill, & Co. (and others named) until they agreed to sign their crews at the shipping offices, and to employ members of the Seamen and Firemen's Union only;" and yet employers are expected to exercise strict neutrality! On the other hand, it is alleged that while the shipowners express a willingness to leave the selection of crews to the captains, one of the regulations of the Shipping federation provides for giving a preference to federation men. After the preposterous treatment the latter have experienced at the hands of the Union men this can hardly be considered unreasonable; but still, as long as the clause remains on the back of the Federation "tickets," so long the ostensible impartiality of the shipowners will be regarded with suspicion.

THE debate on the Factory and Workshops Act Amendment Bill on Wednesday afforded a curious illustration of the occasional differences between the views of philanthropists and operatives in regard to schemes for the benefit of the latter. It appears that in the woollen and worsted manufactories the rooms for fine spinning have to be kept at a temperature of 70 deg., or the work breaks and is otherwise difficult to execute. The Bill proposes that 600 cubic feet of air per head per hour should be introduced as a compulsory minimum,—not over liberal, one would say; but it appears that the operative, so far from thanking his benefactors for this, will only be likely to complain that the temperature of the room is reduced and his work spoiled or rendered more difficult of execution. It does not seem to have occurred to any one who took part in the debate that warmed air could be introduced. This would mean extra cost in the building, no doubt, and as foreign competition already cuts down profits to the smallest margin, this would perhaps be regarded by the mill-owner as financially out of the question; and if it is so, no good would be done to either employer or operatives by pressing unremunerative conditions on the former. Still, that is the way it can be done, mechanically, and it was rather surprising to see no reference whatever to this in a debate in which a good many who might be called practical men took part.

THE evidence of Dr. Thorne Thorne before the Committee of the House of Lords, in regard to the outbreak of diphtheria in St. Bartholomew's Hospital, is to be noted as entirely at variance with the idea which recent experience seems to point to, that diphtheria is nearly always connected with insanitary building. Dr. Thorne denies that the diphtheria at the Hospital arose from any defect in the drainage, and observes that diphtheria is increasing very much at present, and that its increase is coincident with a great general improvement in the sanitary condition of buildings, so that the two classes of facts cannot be connected. This is not only contrary to general belief but to a great deal of detailed evidence in many cases. At all events the surveyor to the Hospital, Mr. I'Anson, admitted that the drainage system was not up to date, that some of the drains ran under the buildings, and that the main drain going into Little Britain was not ventilated. If Dr. Thorne Thorne is right in thinking that diphtheria is not connected with bad drainage, the fortuitous concurrence of the two phenomena in so many cases is rather difficult to understand.

THE House of Commons acted wisely in accepting Mr. Plunket's amendment, last week, on Mr. Sydney Buxton's resolution in regard to Government contracts. The idea of binding a contractor in a Government contract, "under penalty," to observe "the recognised customs and conditions as to rates of wages and working hours which prevail in each particular trade," is absurd on the face of it; it is compelling a man, under legal penalty, to conditions which cannot be legally defined. Mr. Plunket's amendment ran:—

"That in the opinion of this House it is the duty of the Government in all Government contracts to make provision against the evils which have recently been disclosed before the House of Lords' Sweating Committee, and to insert such conditions as may prevent the abuses arising from sub-letting, and make every effort to secure the payment of the rate of wages generally accepted as current for a competent workman in his trade." (Cheers.)

That recognises and recommends a principle, without binding men down to specific undertakings of an indefinable nature.

WE have received some particulars as to the programme and regulations of the International Fine Arts Exhibition to be held in Berlin this summer. We have not space to print them in full, but we extract such points as are likely to be of interest to any of our readers who think of exhibiting there. The Exhibition is to be open from May 1 to September 15, and exhibits must be delivered at the Berlin Exhibition buildings between March 14 and April 10. Among the classes of work admitted are paintings, water-colours, pencil and crayon drawings, designs for stained glass windows or mosaics, architectural designs in model, drawing, or photograph. There is to be a special section for artistically illustrated publications, and for artistic designs for diplomas and other such documents. The decision as to admission will be by admission juries elected for the purpose, except in the case of works sent in by invitation of the Committee. First and Second Gold Medals are to be awarded, "in adequate number," according to the recommendation of the International Jury. This jury is to be composed as follows:—

"1. Fifteen jurors have to act on behalf of the German Art Association, and will be elected by the local associations proportional to the number of exhibiting artists.

2. The foreign countries are entitled to delegate one juror to every twenty of their exhibitors, *i.e.*, for twenty or less exhibitors one juror; for forty to twenty exhibitors, two jurors, &c."

If foreign countries or local associations do not wish to send a delegate or juror at their expense, they will be entitled to nominate as juror any artist residing in Berlin who is not a member of the aforesaid jury. The Committee of the Exhibition will publish the date of the first meeting of the international jury, the number and names of its members. The cost of transport and of insurance on the journey has to be borne by the exhibitor, but all works will be insured by the Committee during the Exhibition. Every exhibitor will receive a free pass to the Exhibition. English architects should endeavour to make a good show with their drawings, not with photographs only, and show their superiority to the Germans in architectural drawing. Plans should not be forgotten, for there is no limit to the number of drawings to be sent by any one exhibitor, and space in the exhibition rooms will be ample.*

THE Americans seem to be following almost too faithfully in the steps of their beloved France in regard to academical training in architecture. The last number of the *Technology Architectural Review*, which we have before mentioned as the Journal of the Department of Architecture in the "Massachusetts Institute of Technology," gives illustrations of the designs sent in for the fourth annual competition for the gold and silver medals of the Architectural League of New York, together with the critical remarks on

* Detailed particulars as to the labelling of exhibits, the mode of package, the best agents to employ for forwarding, &c., can be had, in any language, from Herr Jobelmann, 92, Wilhelm Strasse, Berlin, W.

the designs by Mr. Bruce Price, the Chairman of the Medal Committee. The subject given was "A Pavilion in a city square to contain an heroic statue of Zeus." The design which gained the gold medal consists of a circular pavilion which is an exact copy of the order and the roof and finial of the Monument of Lysicrates, only on a larger scale and with the connecting wall removed, leaving only the open colonnade. Under this is a seated statue of Zeus of heroic size. Around this central pavilion is a circular colonnade of Doric columns with nothing on them but wooden lintels and vine bushes, forming a kind of garland round the central pavilion. Other designs represent small Classic temples or pavilions of various types, all of them pure Classic work, and tinted in the usual French style; the whole giving the impression that every effort has been made to make it appear as an emanation from the École des Beaux-Arts. There is a great deal of merit in the designs, but it may be questioned whether this kind of competition is of much direct value in modern architectural training, or whether this direct imitation of an old academical system is the best line for the schools of a new country to take. Why cannot they strike out a line of their own? The most curious thing about it is that the French are just recently beginning to have qualms of artistic conscience as to this academic training in Greek temple architecture, and to suggest that the claims and conditions of modern architecture are overlooked in the École des Beaux-Arts system; and just at this point the Americans proceed to take up and imitate a system which the French are half ready to discard.

AN American technical paper has an account of the Mexican Gulf Railway, from which it appears that the bridges and culverts are built of white marble and the railway sleepers are of mahogany. There is another railway in this part of the world where the sleepers are of ebony and the ballasting has been made with silver ore. The latter, however, is only the "tip" from an old reduction works near by. Ebony also does not appear to be a very desirable wood from which to make American sleepers, or "ties," as they are called across the Atlantic, as every hole for the spikes has to be bored, a process the American engineer by no means appreciates.

WHEN, as nowadays, no one who can afford to choose seems able to live except in a bright red-brick house, and where the more "wily turns and desperate bounds" the brickwork exhibits the greater is the public estimation of it, the thought how the idols of one generation become *anathema* to the next is brought home to one by the finding of a little book, undated, and actually still in print, and to be seen in shop windows. It is called "The Masons', Bricklayers', Plasterers', and Slaters' Assistant," by one Reinnel, "architect and surveyor," and contains the following noteworthy passage:—"With respect to some other kinds of bricks used formerly for ornamental work, they were denominated from their forms as square, triangular, or curved; they were made at the fancy of the builders, and often expressly for the work in hand; but, as ornamental brickwork is now almost out of date, it is needless to say anything on the subject, as the almost general use of stucco, Roman cement, or mastic has superseded that kind of work, giving a lightness and elegance to our buildings which the most skilful arrangements of brickwork were incapable of producing."

WE doubt whether it is sufficiently realised that air-ducts for the introduction of warmed fresh air require, when that air is of the quality we at present enjoy in London, to be cleaned just as regularly and thoroughly as smoke-flues. It might seem superflous to insist on the imperative necessity of constructing such passages so that they can be easily swept out, were it not that instances are occurring, even in important buildings recently built, where the air-inlets have proved such an intolerable nuisance from the quantity of dirt they shower forth, that it being quite impracticable to clean them, they are being superseded by other methods of heating. Without entering into the relative merits of various systems, it surely ought not to be necessary to abandon one with so much to recommend it, merely on account of such an elementary difficulty.

CONCRETE has been largely employed of late in the construction of military works in Austria and Hungary. Mr. Csongvay de Csegey gives some valuable and interesting details in a German military publication. He assigns as the amount of beton which, under certain rules laid down by him, can be mixed and utilised by the hand labour of a party of seven men, a total of 8 cubic mètres per day, or 1·14 cubic mètres (40·26 cubic feet) per man. If the amount of work to be carried out reaches 4,000 cubic mètres, it will be generally cheaper to substitute mechanical power for hand-labour in mixing. By the use of a plant consisting chiefly of a combined mortar-mill and cylindrical mixing apparatus five men can produce 77 cubic mètres of concrete (beton) daily, or about 49½ cubic feet per man. A useful hint is given as to stuccoing. It is said that if the stucco is not applied immediately the boards are removed from the face of the concrete the process had better be omitted altogether, as it is difficult to get the stucco to adhere. In cases where the concrete has to withstand water-pressure, it is desirable to coat the surface with a mixture consisting of 1 part cement, 1 part sand, and ¼ to ⅙ part of slaked lime.

THE number of accidents in the streets of London is, as the Home Secretary said in the House of Commons last week, serious. It is satisfactory to know that the Chief Commissioner of Police has the subject under his consideration, but what he can do, except put more police on duty in the streets, it is impossible to say. The fact is that the best remedies are mechanical rather than personal. Bridges, underground passages, and refuges, together with well-lighted crossings, are the best remedies for street accidents. We take it that the cost of attending to a thronged street crossing is about a hundred pounds a year in wages to the police. If this sum be capitalised it is obvious that a bridge or an underground passage would be cheaper in the long run, and would not delay the vehicular traffic as the present system does. The bad lighting of many of the thoroughfares is also a cause of accidents, as is the absence of lights in some of the vehicles which go about the streets. It is high time that more mechanical improvements in respect of street crossings were adopted.

WE are probably only at the beginning of an era of high buildings: the system of living in flats is extending, and will, there can be little doubt, become characteristic of life in large towns. It is, therefore, very desirable that the width of streets in which high buildings are erected should be considered. The high buildings of Northumberland-avenue have spoilt what might have been a fine street. In Kensington High-street, at the present time, another block of buildings is rising; if a similar block were to be erected on the opposite side the street would clearly be too dark. It has, no doubt, to be observed that these high buildings, after a certain period of time, become entitled by prescription to a right to light; therefore, the person who first erects a high block of buildings has the best chance of being unmolested in his enjoyment of the right of light. But be that as it may, it is necessary that the community, for the sake of the general appearance and health of the metropolis, should insist on there being very wide thoroughfares between high buildings, and to insure this very high blocks should be set well back from the ordinary level.

THE competition for the Public Library at Ayr is one of the cases in which the building-owners, in this case the Town Council of Ayr, have made a selection in opposition to that of the Assessor (Dr. Rowand Anderson); and in a local paper we observe that they are severely taken to task for having done so. It does not appear, however, that the Council invited Dr. Anderson to make the selection, but only to advise. We have read the detailed report of the discussion in the Council, in which it appears that no one pretended to speak of the Assessor's judgment with disrespect, but that the design placed second by the Assessor was admitted by him to be the best plan, though not the best design; and a majority of the Council preferred having the best plan. We cannot undertake to say, not having had an opportunity of examining the drawings, whether they made an unwise choice; but they were certainly acting within their rights. As we have before said, it is unreasonable for the profession to expect that any body of men will consent to the position that a building which they are to use and to pay for is to be chosen absolutely for them by another man, however competent a judge he may be, without any right to an opinion of their own in the matter; and we desire it to be distinctly understood that we cannot support any such claim on the part of architects; unless of course in a case where a competition committee have formally bound themselves to accept the Assessor's decision, which was not the case here. The Assessor's assistance was not therefore thrown away; but for him the Council would very likely have made a worse choice; as it is, the Assessor pointed out the best plan, and they have chosen it. The Assessor would have liked them to have chosen a building with an inferior plan and a better design; they prefer the best plan: they have a perfect right to do so. Every building committee that is sensible and honest, when they engage an able man as assessor, will of course give all weight to his judgment—it appears to us that the Ayr Town Council practically did do so in this case; but they are not bound to give up all right to have their own opinion on his opinion.

ON Monday last the first of what it is intended shall be a series of annual *conversazioni* was held by the Founder and Mrs. Hammond at the Electrical Standardising, Testing, and Training Institution, Faraday House, Charing Cross-road. The work of the Institution, which has but recently been started, largely consists of standardising electrical instruments,—that is to say, comparing electrical instruments such as ammeters, voltmeters, Wattmeters, Coulomb meters, Joulemeters, &c., with the recognised standards, and thus enabling public companies or private individuals to discover if they are making proper measurements. In addition to the above work the engineers attached to the Institution inspect, *in situ*, installations or new apparatus and report upon them. Again, for the benefit of those inventors who have not the private means or facilities for carrying out the experiments necessary for the development of their inventions, the Institution lets private experimenting rooms and furnishes the necessary apparatus and power. The training of electrical engineers forms an important branch of the business of the Institution. At the reception on Monday evening the guests went into a large office at the back of the building, in which Mr. Langdon-Davies showed an installation of his phonopore in action. In the large Physical Laboratory on the first floor, a concert was given, and an interesting collection of electrical appliances was exhibited by the Electrical Supplies and Fittings Company. Mr. W. H. Preece, F.R.S., had on the second floor made a complete working installation of the telegraph instruments in common use by the General Post Office; and there was also a most interesting exhibit by the General Electric

Company, the motors especially attracting notice. In one of the lecture-rooms Messrs. Elliott Bros. showed some of the chief uses made of electricity on her Majesty's ships. In other rooms were shown the Lowrie Hall apparatus as used by the House to House Company, and Mr. Ferranti's apparatus as used by the London Electricity Supply Corporation; a 150 h.-p. Ferranti armature attracted a great deal of attention. We must not omit to refer to a most beautiful exhibit of highly-finished lathes and tools by Messrs. Holtzapffel & Co.

ACCORDING to the report in the *Times* of Mr. Goschen's reply in the House last week, the Government intend to devote a large portion of their surplus arising from patent fees, being nearly 94,000*l.* in the year 1889, to build a new Patent Office. The office is now housed in the substantially-constructed quarters situated between Quality-court, Chancery-lane, and Southampton-buildings, and in Nos. 11 and 12, Staple-inn, southern side. Nos. 12 and 13 (No. 13 is the Land Registry) were erected for the Taxing-masters in Chancery, in 1843, after the designs of Messrs. Wigg & Pownall, architects. These two terrace houses are in the domestic Jacobean style, and, together with the west gate-house, form an effective and, for London, an uncommon group, standing upon a level higher than that of the inn garden. No. 11 is the oldest part of the inn, excepting the hall and the Holborn side. Its doorway is inscribed:

Reaedificata Anno Dñi 1699 —
Roberto Browne Geñ Principali.

On the setting up of a Commission for Patents under the Act of 1852, the Lord Chancellor made an order to appoint the then Great Seal Patent Office as the office of Chancery for the filing of specifications, and the Commissioners, by a subsequent order, directed that the law officers' warrants for patents should issue from the new consolidated office. Room was found for the Commission on the ground-floor of No. 25, Southampton-buildings; where, as some of our elder readers will remember, the public used to make their inspection of specifications, &c., in the long, dark corridor, a place ill adapted for such a purpose. A technical library was formed in 1855, to which some valuable additions were made by the late B. Woodcroft. For this a new building, lately enlarged, was opened on the second floor on April 16, 1867. The removal of the Chancery Registrars from the first-floor into the Courts of Justice, and the departure of the Lunacy Commission from an adjoining block —their presence there having afforded a long-standing joke about inventors and their doom—have left the Patent Office, now a department of the Board of Trade, in entire possession.

NOR do we thus hear for the first time of a new Patent Office. Concurrently with the announcement of rapidly-increasing profits, the Commissioners' earlier reports make repeated complaint of confined space, and plead for better accommodation. In 1859 a fresh site was approved, and plans and estimates were prepared by Messrs. Banks & Barry, architects, for an office, with library, to be portion of one complete design, upon the ground of Burlington House and its garden, for a group of Departmental buildings. A change in the Ministry rendered that scheme abortive. Three years later it was proposed to occupy the Fife House site, near to the Board of Trade, now covered by Whitehall-court. In January, 1884, the authorities relieved themselves of the Patent Museum, South Kensington, by handing it over to the Science and Art Department. That museum originated in an interesting collection made by Mr. Woodcroft, and which was sent to South Kensington about thirty-five years ago. As the quasi-legal character of the Patent Office has ceased with the dissolution of the Commission, under Mr. Joseph Chamberlain's Act, we can see only one reason why it should remain where it is. A large number of patent agents have established themselves round about, whilst the ready access afforded to them daily until 10 p.m. to the library—the first free library of its kind, we believe, that was opened in London—is a great convenience to them and their *clientèle*. A considerable area of vacant land lies between Chancery-lane and Furnival-street, and, as we understand, some of this, together with a few houses and their large gardens in Took's-court,* Cursitor-street, may probably be utilised for the new buildings. If the old house, No. 11, Staple Inn, be pulled down, we hope, albeit with small confidence, that the Office of Works will adopt a design somewhat in keeping with the existing features of the terrace, or else of the Inn.

IN his recent book, "Over the Teacups," Dr. Oliver Wendell Holmes makes the following pretty and fanciful suggestion as to the origin of the preference for the pyramid form in Egypt:—

"How did they get their model of the pyramid? Here is an hour-glass, not inappropriately filled with sand from the great Egyptian desert. I turn it, and watch the sand as it accumulates in the lower half of the glass. How symmetrically, how beautifully, how inevitably, the little particles pile up the cone, which is ever building and unbuilding itself, always aiming at the stability which is found only at a certain fixed angle! The Egyptian children playing in the sand must have noticed this as they let the grains fall from their hands, and the sloping sides of the miniature pyramid must have been among the familiar sights to the little boys and girls for whom the sand furnished their earliest playthings. Nature taught her children through the working of the laws of gravitation how to build so that her forces should act in harmony with art, to preserve the integrity of a structure meant to reach a far-off posterity. The pyramid is only the cone in which nature arranges her heaped and sliding fragments; the cone with flattened surfaces, as it is prefigured in certain well-known crystalline forms."

The last sentence is a little inconsistent, however, as the professed object was to show that the pyramid was a form naturally suggested in a sandy country, and the coefficient of stability of the sand-grains does not suggest the square plan of the pyramid. As a fancy, however, it is worth a record in an architectural journal.

IN the last number of *L'Architecture*, M. Jourdain writes an amusing letter with the object of persuading the architectural contributors to the May exhibitions to patronise the new *Salon* in preference to the old. In the first place, he complains, the jury of the old *Salon* are all "Prix de Rome" men, and he declines to admit that all architectural judgment and knowledge are concentred at the Villa Medici. Then he complains that the old *Salon*, to show its spirit of progress, has stopped all the free admissions which used to be sown broadcast among pupils of the École, medalled artists, every one who was "le moins du monde de la maison." The Société des Artistes Français has thus shown itself "tracassière, chipotière, liardeuse, hargneuse," and other long words of sinister signification. Worse and worse, it has practically suppressed "varnishing day" as an occasion for the brotherly meeting of artists only, the last "réunion artistique" left, and has thrown it open, through payment at the doors, "à tout ce que Paris possède de boursiers, de rastoquouères, de filles publiques, et d'imbéciles. Et Dieu sait s'il y en a!" Now at the Société Nationale all this, says M. Jourdain, is quite different,—"pour le moment," as he qualifies it. The architects will be received with open arms there, if they will only go on in a body. But M. Jourdain is afraid they will not. Architects, he says, are essentially conservative. He believes there are some in Paris who still burn candles as a protest against such novelties as gas and electricity; and he doubts whether any of them dare show themselves in the tramway leading from the Palais de l'Industrie to the Avenue Rapp.

* The Duck's-court of Ogilby's map, 1685: in Rocque's map of 1755, it is named Teuke's-court. The sponging house here, in which Sheridan stayed during the last year of his life, was at the corner, east, with Cursitor-street. There is a fine house-front, of red brick with pilasters, in the court, Furnival-street end.

BYZANTINE ARCHITECTURE.*

BY PROFESSOR AITCHISON.

Secular Byzantine Architecture.

As Constantinople was a Christian city as well as the seat of the lower Empire, we might expect that when it was taken by Mahomet the Second (May 29, 1453) all the national buildings would be destroyed, and as Mahomet and his Turks were Mussulmans that, if nothing else were destroyed, the churches would be; in fact most of the secular buildings were destroyed, but curiously enough the Christian churches were found to be so perfectly adapted to the Mussulman ritual, that a great number of them, including Sta. Sophia were converted into mosques, and the conversion they required was small, the altars, inconostases, and the ambos were removed, the Mihrab or Kibla was set out on the line of Mecca, which rarely coincides with the orientation of the Christian churches, and the step in front of the Kibla was put at right angles to it, which makes many believe that the churches are out of the square.

James Fergusson believed that many of the Turks were still housed in the old palaces; but, from domestic privacy being fanatically cherished by them, it is impossible for antiquaries to enter them, and to settle the question.

The Marquis de Voguë has found ruins of churches, of secular public buildings, and of private houses in Central Syria; but their requirements must have been different from those of the Roman palaces at Constantinople, even if the difference of climate were alone to be taken into consideration. The nearest approach we have to the Byzantine palaces of Constantine's time is probably the Palace of Diocletian at Spalato; still there are plenty of descriptions in the Byzantine writers of parts of the Imperial Palace at Constantinople. As the Imperial Palace was of great magnificence, I will give you a description of it. Through the indefatigable industry of Labarte, particulars were gathered by him from the Byzantine authors, and from these he drew out a plan of it, as it existed in the tenth century, mainly from the description of Constantine Porphyrogenitus. An enlarged diagram of his plan is now exhibited, and I am mainly indebted to him for the description. If this description were of no other use, it would at least enable you to comprehend much of the doings of the Emperors at Constantinople, which without it would be incomprehensible. And you will also hear of the magnificence with which it was decorated.

Up to a certain period, Rome had given the ideas of sumptuous decoration to the barbarians, and to this day certain words in general use bear testimony to it. The oriel window was the window to the golden parlour of the monasteries, and these golden parlours were imitated from the gilded or gold-plated rooms of the imperial palace. We know that as early as the days of Horace, grand houses had ceilings of ivory and gold. These habits of magnificence were not given up when the Romans migrated to Byzantium; but, on the contrary, the Byzantine emperors, who were mostly of barbarian origin, tried to make up for the loss of art by the lavish use of gold, silver, enamel, and jewels. The Bulgarian peasant, Justinian, had a passion for costliness, not only in his own palace and for his own court, but for churches too, and the new Sta. Sophia having been built by him, and being the court cathedral, he spared no expense to make it sumptuous; he had all the fittings and furniture of the Bema made of gold or solid silver, and this silver was mostly gilt. Procopius tells us that 40,000 lbs. weight of silver was given by Justinian for this purpose, and he, the empress, and the whole court and its attendants were clothed in equally sumptuous apparel. This latter taste, however, was antecedent to Justinian, for, not to speak of the dresses of Diocletian and Constantine, we read in Gibbon of the Emperor Julian calling for a barber soon after his entrance into the imperial palace, when an officer magnificently dressed presented himself. "It is a barber," exclaimed the prince, with affected surprise, "that I want, and not a receiver-general of the finances," and on questioning the barber he was told that, besides a large salary and some valuable per-

* Being the Fourth Royal Academy Lecture on Architecture this season. Delivered on Thursday, February 5, 1891. (For the First, Second and Third Lectures, see pp. 82, 103, and 123 *ante*.)

quisites, he had a daily allowance for twenty servants and as many horses. The savage, and often naked, Arabs rapidly fell into this taste for costliness, and even surpassed the originators, for we read of the ambassadors of Constantine (the 7th) Porphyrogenitus, the Artistic Emperor, (916-959), visiting the Caliph El-Muktedir (917-942) in 927, and being astonished at the magnificence of his court; Lane, in his notes to the "Arabian Nights," gives the following account: "In the beginning of the year of the Flight, 305 (June A.D. 927), two ambassadors from the Roman Emperor (Constantine 7th, Porphyrogenitus) arrived in Baghdad on a mission to the Khaleefeh El-Muktedir, bringing an abundance of costly presents;" and the scenes which they witnessed are thus described, apparently, however, not without some exaggeration:—"They were first received by the Wezeer, who, at the audience which he granted to them in his garden palace, displayed on this occasion a degree of magnificence that had never before been manifested by any of his rank; pages, memlooks, and soldiers, crowded the avenues and courts of his mansion, the apartments of which were hung with tapestry of the value of 30,000 deenárs; and the Wezeer himself was surrounded by generals and other officers on his right and left and behind his seat, when the two ambassadors approached him, dazzled by the splendour that surrounded them, to beg for an interview with the Khaleefeh. El-Muktedir, having appointed a day on which he would receive them, ordered that the courts, and passages, and avenues of his palace should be filled with armed men, and that all the apartments should be furnished with the utmost magnificence. A hundred and sixty thousand armed soldiers were arranged in ranks in the approach to the palace; next to these were the pages of the closets, and chief eunuchs, clad in silk, and with belts set with jewels, in number 7,000; 4,000 white, and 3,000 black: there were also 700 chamberlains; and beautifully ornamented boats of various kinds were seen floating upon the Tigris, hard by. The two ambassadors passed first by the palace of the chief chamberlain, and, astonished at the splendid ornaments and pages and arms which they there beheld, imagined that this was the palace of the Khaleefeh; but what they had seen here was eclipsed by what they beheld in the latter, where they were amazed by the sight of 38,000 pieces of tapestry of gold-embroidered silk brocade, and 22,000 magnificent carpets. Here also were two menageries of beasts, by nature wild, but tamed by art, and eating from the hands of men: among them were 100 lions; each lion with its keeper. They then entered the palace of the tree, enclosing a pond, from which rose the tree: this had eighteen branches, with leaves of various colours (being artificial), and with birds of gold and silver, of every variety of kind and size, perched upon its branches, so constructed that each of them sang. Thence they passed into the garden, in which were furniture and utensils not to be enumerated: in the passages leading to it were suspended 10,000 gilt coats of mail. Being at length conducted before El-Muktedir, they found him seated on a couch of ebony, inlaid with gold and silver, to the right of which were hung nine necklaces of jewels, and the like to the left, the jewels of which outshone the light of day. The two ambassadors paused at the distance of about a hundred cubits from the Khaleefeh, with the interpreter. Having left the presence, they were conducted through the Palace, and were shown splendidly-caparisoned elephants, a giraffe, lynxes, and other beasts. They were then clad with robes of honour, and to each of them was brought fifty thousand dirhems, together with dresses and other presents. It is added, that the ambassadors approached the Palace through a street called the street of the 'Menárehs,' in which were a thousand menarets. It was at the hour of noon; and as they passed, the muëddins from all these menárehs chanted the call to prayer at the same time, so that the earth almost quaked at the sound, and the ambassadors were struck with fear." ("The 1001 Nights," Lane, 3 vols., 8vo., London, 1859. Note to the story of the Second Lady of the Three Ladies of Baghdad.)

I give you this extract partly because the Imperial Palace as shown is of the date of Constantine Porphyrogenitus, and partly to show you that the rarities and ceremonials of the Caliph's palace were almost a counterpart of those of the Byzantine Court. The Grand Triclinium of Magnaurus was built by Constantine the Great, and much resembled the great hall of Diocletian's Palace. It was used by the Emperors for the reception of Princes and Ambassadors, and was a vast hall formed into two aisles and a nave, by six columns on each side; at the end was a daïs, reached by steps of green marble, with an apse at the back; two columns on each side of this apse supported curtains with which the end of the hall was draped.

"The Emperor was robed in the Imperial dress before mounting the throne, called the throne of Solomon, and all the Senators and grand dignitaries were there assembled. The throne was of gold, enriched with precious stones. There were birds that warbled by ingenious mechanism; close to the throne there was an enormous cross of gold covered with precious stones; beneath it were placed the golden seats for the members of the Imperial family. At the bottom of the steps of the daïs on which the throne was placed were two lions, which raised themselves on their paws and roared like real lions; not far from the throne, golden trees bore on their branches birds of different sorts who imitated the harmonious song of the birds whose form they borrowed; a great organ, enriched with precious stones and enamels, was also placed there."

The palace of the tenth century was built piecemeal. Constantine built his palace, which was largely added to by that great builder, Justinian; subsequent Emperors made additions, built new palaces, or new suites of apartments for themselves. We can easily understand that those who had murdered their predecessors had delicacy enough to prefer using new rooms which did not remind them of their crimes. These additions were made until a new palace was built at Blachernæ, on the Golden Horn, and the old palace was less and less used, until it was finally abandoned. Benjamin of Tudela, the Jewish Rabbi, who visited Constantinople in the twelfth century, only speaks of the palace at Blachernæ, and when Mahomet II. took Constantinople there were only the ruins of the old Imperial palace.

Constantine the Great, though professing Christianity, had not done away with the old Pagan worship, and was only baptised on his death-bed by an Arian bishop. In the old Roman days religion was intimately connected with every act of life, and as the Christians increased in number and power they substituted the Christian worship for the Pagan, but kept up the old custom of associating it with every act of life, so that cathedrals, churches, baptisteries, chapels, and oratories became as frequent as the old temples and shrines. You will find the Imperial Palace crowded with these new religious buildings. Eventually, the Emperors before they were crowned had to make profession of the orthodox Christian faith, and as in an ecclesiastical point of view they were inferior persons to the Patriarch, they frequently had to attend public worship in the cathedral, and to have chapels and oratories at hand to say their prayers in. The bulk of the rooms on the south side of Sta. Sophia were mainly devoted to the Emperor's use. The hippodrome acted the part of the old Roman forum, where the people assembled, and criticised the Emperor's ways, and the games were always presided over by the Emperor. The hippodrome begun by Septimius Severus was finished by Constantine the Great. It had a great influence on Constantinople, for Constantine set out his palace at right angles to it, and subsequently Sta. Sophia was set out in the same way parallel with the palace. The hippodrome was once a museum of art; the horses of St. Mark, which were taken by Theodosius II. from the island of Chios, came from it, now nothing remains but the obelisk, the bronze tripod of Delphi, with headless serpents, though one head is in the museum, and the built obelisk of Theodosius stripped of its brazen covering. The palace was not one building with an architectural front, but was a conglomeration of buildings, open areas, passages, baths, churches, and oratories, stables and gardens. The main group consisted of three palaces called the Chalce, the Daphne, and the Sacred Palace; this last is considered by many as the palace proper, but the Hippodrome, the Forum Augusteum, the Baths, the Cathedral, and the Palace were joined together, and really formed a sort of whole, while smaller palaces were dotted about the grounds, and were called the Aetos, the Boucoléon, the Porphyry Palace, and the Penta-coubouclon.

I think the simplest plan will be to begin with the Hippodrome, and describe the position and collocation of the parts.* It had the form of the Roman circus, only the triumphal gate at the south end was obliged to be left out on account of the steepness of the ground. It had four gates, two to the east and west, nearly opposite the south meta, the south-east gate being called the Gate of Death, for though Constantine had abolished the gladiatorial games, it seems that the name of Porta Libitinensis was still used; it was originally so called because the bodies of the slaughtered gladiators were taken out through it; and two gates, also east and west, at the north end, nearly in a line with the platform in front of the Emperor's throne. At the back, farther north, was the Palace of the Cathisma, and beyond that the Baths of Zeuxippus. The north-east angle of these baths touched the south-west angle of the Forum Augusteum, a moderate-sized square, about 623 ft. from east to west, by 460 ft. from north to south, about the size of the Place Vendôme at Paris. The Forum was surrounded by a peristyle or cloister; on the south side it bounded the Palace of the Chalce; on the north Sta. Sophia, the Emperor's rooms, however, projecting into it; on the east it touched the face of the Senate House, the Church of St. Mary Chalcopratiana, and the front area of the grand Triclinium of Magnaurus; on the west side I know not what it touched, but on this side were the chapels of St. Constantine and St. Mary of the Forum. This Forum of Augustus contained most of the sculpture and statues that had been taken from the different provinces of the Roman Empire by Constantine to adorn his new capital. To the south of the Chalce was the Palace of Daphne, and to the east of these two the Sacred Palace. The Palace of the Chalce was almost entirely rebuilt by Justinian after it had been burnt in the riots of the Nika, and was entered from the south-west corner of the Forum Augusteum by an iron door; the Atrium ended at the south by a hemicycle covered by a semi-dome. South of this was a domed hall (No. 20), ending southwards with a smaller hemicycle. I here give you the description of it from Procopius (Lib. I., cap. 10):—"As, according to the proverb, we know the lion by his claw, so my readers will learn the magnificence of this palace from the entrance-hall. This entrance-hall is the building called Chalce; its four walls stand in a quadrangular form, and are very lofty; they are equal to one another in all respects, except that those on the north and south sides are a little shorter than the others. In each angle of them stands a pier of very well-wrought stone, reaching from the floor to the summit of the wall, quadrangular in form and joining the wall on one of its sides: they do not in any way destroy the beauty of the place, but even add ornament to it by the symmetry of their position. Above them are suspended eight arches, four of which support the roof, which rises above the whole work in a spherical form, whilst the others, two of which rest on the neighbouring wall towards the south and two towards the north, support the arched roof which is suspended over those spaces."

From this vestibule to the westward you enter into the oratory of the Saviour (No. 21), containing the tomb of the Emperor John Zimisces (969-976); to the north and east of this was the Noumera (No. 22), used as a prison; from the vestibule to the east you entered through a splendid bronze door into (No. 23) the Triclinium of the Scholars. They were a part of the Prætorian guard. At the south-west end of this was the chapel of the Apostles (No. 24); to the east of the Triclinium of the Scholars was a passage (No. 26), and the lychnos (No. 25), where the Emperor received the homage of his servants and bestowed dignities on them; to the east of this was the Triclinium of the Excubitors (No. 27), another band of Prætorians, and that of the candidates (No. 28), a cohort of the Emperor's guard; at the west end of this hall was a dome on eight columns, under which was a great silver cross. No. 32 was the grand consistory, and had three ivory doors. At the end was the Emperor's throne, covered by a cyborium, where he received the homage of the great officers of the crown. No. 34, at the side of it, was a large dining-room, where the Emperors dined the dignitaries on festivals; in front of these four halls last-mentioned was an open yard, about 65 ft. wide, divided in the middle by a fence and gate, called the curtains, through which the Emperor occasionally rode; it was

* See the lithograph plan published with this number.

prolonged up to (No. 35) the Church of Our Lord, the Royal Chapel, up to the time of Basil the Macedonian (867-886). At the back of this church was a passage that led into the Phiale of the Sacred Palace, but by passing through the sacristy of the church one entered the Heliacon, or open area of the grand Triclinium of Magnaurus (No. 116), the splendours of which I have before described. On entering the Palace of Daphne from the hippodrome, by the door 39, you come into a large open court (41), having a guard room called the porter's lodge in the south-west angle (No. 40), and to the south of this was the covered hippodrome of the palace (No. 42) originally used by the Emperors, but it afterwards served as a shelter for the Senators' horses when the Senators waited on the Emperor at his palace; at the west corner of this was a staircase (111) by which a garden called Phiale was entered; 44 A and B are open courts with peristyles, 45 is the ancient chapel of St. Mary of Daphne; 46 is the oratory of the Holy Trinity; 47 the baptistery, and 114 a staircase leading into the Justinianos (No. 109); 48, the Triclinum Augusteos, was a vast hall used for receiving the homages of the functionaries, and was often used for crowning the Empresses; 50 was an octagonal hall, and 51 the Emperor's bedroom, where he left his imperial robes and crown, after attending service in state at Sta. Sophia; 52, a long open corridor or peristyle, which led to 54, the Church of St. Stephen, that preceded the platform of the Cathisma Palace, and overlooked the race-course; from the windows of this church the ladies of the court saw the races and games. The Emperor Heraclius was crowned here, and it was used for celebrating the marriages of the Emperors. Above, to the north of this open corridor, No. 52, and between the Palace of the Chalce, were the remaining open courts and chambers of the Palace of Daphne; 38, the Grand Triclinum of Nineteen Couches; it was divided into three parts; 38A was the portico, 38B the dining-room, and 38C the bedroom. Here the Emperor entertained guests at Christmas. All the plate used was of gold, and fruit was served in three gold vases, so heavy that they had to be wheeled on carriages, which were covered with purple, and they could only be lifted on to the tables by gilded leather ropes and pulleys; there were two silver columns at the end, between which was the Emperor's throne. It was not only used for grand dinners, but for grand receptions; many of the Empresses were crowned here, and the Cæsars were here installed. I may say that at the close of the old Roman Empire, and during the continuance of the Lower Empire, the second of the joint Emperors was called Augustus, and the heir to the throne, Cæsar. For instance, Constantine was made Cæsar by Galerius, but claimed to be made Augustus; and the same dispute took place between Constantius and Julian. In this Triclinum of the Nineteen Couches, deceased Emperors were laid in State.

The Sacred Palace had an atrium semicircular at both ends. No. 60-61, which was called the mysterious phiale of the τρίκογχος, or triple shell, its mysteriousness was probably owing to its acting as a whispering-gallery. The original meaning of the word phiale was a saucer, or round, flat drinking-cup; but the word was afterwards used for the flat basin of a fountain, and then for any open space with a fountain in it. The triple shell applied to the half domes of the apses; there were three apses. I believe κόγχος is used when the inside of a squinch is hollowed out like a shell. From the north side of this you entered into the Chapel of St. John (65), and from the south side into the baths (63); in the parts behind the hemicycle (67), A was a guard-house, and B a door to the under part of the terrace of Daphne. There was also a door into the hemicycle; 62 was similar—A, door to the under-portico of Daphne; B, door to baths; there was also a door into the hemicycle, and another into the courtyard. The phiale was also used for the games played before the Emperor and his friends. Two flights of steps round the eastern hemicycle led into the sigma (71), a large and long room, with apses at both ends, and three doors on its east side, so called from its resemblance to the old Greek sigma, or C; fifteen columns of Phrygian marble supported the ceiling, the walls were lined with precious marbles, on which verses were engraved. At the south end two bronze lions' heads spouted water into a vase, and in the middle was a little edifice of four columns supporting a dome, under which the Emperor's throne was placed when games went on in the courtyard; in front of the throne was a balcony (No. 70); to the north of this was the Triclinium Eros (79), used as a museum of arms. From the south end was entered No. 64, called Triclinium Pyxites, used as a vestry by the clergy of the palace. The two side doors that led into the triple shell were of bronze, the middle one of silver. The room itself, the triconque (73) was a hemicycle, from which three apses were recessed; the half domes of these were called the shells or conchs. Two columns on each side of the east apse carried the archivolt, and this apse had steps or seats round it; the walls of this Triclinium were covered with various coloured marbles, and its ceiling was gilt, and pierced for light. The Emperor Theophilus (829-842) built this part of the Sacred Palace, and used to work here with his ministers. This probably also acted as a whispering gallery, as well as the room under it. To the east was a T-shaped gallery (74); to the north of this gallery were the offices (77) A and B, with an open court, C, in the middle; to the south (78) were the kitchens, lit from the garden. The north end of the top of the T-shaped gallery ran into another very long gallery, called "The Gallery of the Forty Saints" (80); to the north of this passage was the "Pearl" (No. 81), or an apartment wholly built by Theophilus (829-842), surrounded on three sides by passages, and on the fourth by the gallery of the Forty Saints. It consists of an ante-room, a bedroom, and a sitting or dining-room. The roof of this dining-room was supported by eight columns of Rhodian marble (black and gold), and its walls were covered with marble mosaics of animals. The bedroom was vaulted, was carried by four marble columns, and was gilt, or of gold mosaic. Out of the third apse of the three-shell Triclinium were the upper winter rooms of the same Emperor (83), called the Carian, from being lined with Carian marble; and to the east of it was the gallery (84). To the east of this was the "Camilas" (85), consisting of an ante-room A, and a vast hall lined with verde antique, with six verde antique columns ing the roof; above the marble lining were mosaics of people eating fruit; at the south end was a double apsed oratory to the Virgin and St. Michael (85 B). Under it, on the ground-floor, was a room converted into a library by Constantine Porphyrogenitus; beyond (No. 86) was the coubouclion mesopatos, the ceiling carried by four columns of Phrygian marble; the wall was covered with gold mosaic, on which were trees of verde antique; 87 was the Empress's dressing-room, and below it was her bedroom, called the mosaic-room; the vaulted ceiling was supported by seven columns of Carian marble, its walls and roofs were covered with mosaic, and its floors are said to have resembled a meadow enamelled with flowers; 88 contained a room and an oratory to St. Agnes. The last (89) had a staircase for the Empress on one side, and the remaining part was decorated like the former chamber, and had to the south a vestibule into the garden, through which she could go under the triclinum Lausiacos to the Cenourgion (100 to 104). The Lausiacos (92) was a long passage, the north end of which went into the gallery of the Forty Saints, and the south into the grand triclinum of Justinian; in the middle of the garden to the east of the former rooms, and nearly opposite 86, was a garden pavilion (90) with two rooms on the ground-floor and two above. This passage Lausiacos separated the golden triclinium or throne-room from the part connected with the triconque. To the west of this passage, and adjoining the kitchen, is the oratory of St. Basil (93); to the east is (94) the tripeton, horologion, or vestibule to the throne-room. The Patriarch waited in the tripeton while he was being announced to the Emperor. The throne-room (95) was entered on the west by a silver door, the work of Constantine Porphyrogenitus. It was an octagon enclosed in a square, its interior is not unlike St. Vitale in plan: on each of its eight sides were apses; above the arches of the apses was an entablature whose projecting cornice formed a circular gallery round the hall used on grand occasions by the Empress and her ladies; the dome, which rose from the back of this, had sixteen windows. The west apse (A) formed the entrance, and its front was covered by a purple curtain, hung by silver rings, called the curtain of the Pantheon, or the Pantheon only; there was another doorway into this apse to the north, communicating by an irregular-shaped room with the "Passage of the Forty Saints." As each of the apses of the throne-room were enclosed by curtains they formed separate rooms. B was used as the vestry of the Patriarch. C was the entrance to the Emperor's private apartment; when the Emperor gave a grand banquet, the musicians were here, and in B; the apse D was called that of St. Theodore, and was used as the robing-room of the Emperor; at the back of it was the oratory of St. Theodore (96), the Emperor's robes, his crown, his arms, two shields of enamelled gold, and all the arms and insignia of office of the head officers of state were kept here; the apse E had a silver door of two leaves, which led to the Heliacon of the lighthouse (105); this apse had a picture in mosaic of Christ on his throne, to which the Emperor prayed on entering or retiring, and in this apse was placed the imperial throne. The apse F is supposed to have communicated with a staircase (97) to the gallery.

99 is another staircase communicating with the dining-room of the cenourgion, and it is supposed that the Empress and her court went into the gallery on great occasions. Apse G communicated with the "Gallery of the Forty Saints." H is supposed to have held the porter of the Sacred Palace, and, when he was absent, the keys of the palace; the pavement was designed in the 10th century by Constantine Porphyrogenitus, and seems to have been of Opus Alexandrinum, bordered with silver; the walls and vaults were covered with mosaic, and from the centre of the cupola hung a huge candelabrum called Polycandelon. Basil, the Macedonian, after having murdered his colleague and benefactor Michael the 3rd, did not care about living in the late Emperor's apartment, and had one built to the south of the throne-room, which was called the cenourgion. This apartment afterwards became the private dwelling of the Emperors, until they migrated to the palace at Blachernæ. The first room of the apartment, No. 100, was the Emperor's private dining-room, entered from the tripeton, which also communicated with an irregular chamber (99) in the outer square of the throne-room. No. 101 was called the makron, or long gallery of the bedroom, and touched the narthex of St. Mary of the lighthouse (106), from which it was shut off by silver doors. No. 107 was the Chapel of St. Demetrius, across which the narthex before mentioned extended. From the makron the door into apse C of the throne-room opened. The dining-room and makron must have been lit from the roof. Constantine Porphyrogenitus gives the following description of the vast hall, No. 102:—"It is sustained by sixteen columns, disposed at equal distances. Eight are of verde antique, and six of onyx, sculptured with branches of the vine, in the middle of which all sorts of animals disport themselves. The last two columns are also of onyx, but the artist has decorated them with oblique stripes; spiral reeds or flutes, I presume; in all this work variety of form has been sought as an additional pleasure for the eye. All the hall from the top of the columns to the vaults, as well as to the east cupola has been ornamented with most beautiful mosaics, representing the orderer of the work, enthroned in the midst of the generals who had shared the fatigues of his campaigns; these present him the cities he has taken as an offering; immediately above, on the vault, are reproduced the herculean feats of arms of the Emperor, his great works for the happiness of his subjects, his efforts in the field of battle, and his victories granted by God." To the east of this hall is a little vestibule, 103, which preceded the bed-room; its ceiling was a cupola, in which doubtless were windows; the mosaics which decorated the walls were remarkable for the composition of the subjects and the harmony of the colours. Constantine Porphyrogenitus had constructed in this vestibule a basin of porphyry, surrounded by marble columns, admirably polished; the water-pipe was hidden by a silver eagle with its neck turned aside, and with the proud air of a lucky hunter it held a serpent in its claws. The rooms 103 A and B, were serving rooms, one of which had a staircase in it, for although the throne-room was on the ground, the ground sloped so rapidly to the sea that here it admitted of there being a lower storey. Constantine Porphyrogenitus has also left an account of the bedroom (104):—"The bedroom built by the

Emperor Basil is a veritable master-piece of art. Over the ground in the middle a peacock spreads itself—a fine piece of mosaic. The bird of Medea is enclosed in a circle of Carian marble. The streaks of this stone stand out in such a way as to form another larger circle. Outside this second circle are what I shall call brooks of the green marble of Thessaly, which spread themselves in the direction of the four corners of the room. In the four spaces formed by these brooks are four eagles, rendered with such truth that one could believe them living, and ready to fly away. The walls on all sides are covered at the bottom with slabs of glass of different colours, which reproduce different sorts of flowers. Above these is a different work, of which gold is the ground, which separates the ornament of the lower part from that of the upper part of the hall. One finds in this part another work of mosaic on a gold ground, representing the august orderer of the work upon his throne, and the Empress Eudoxia, both clothed in their Imperial robes, and with crowns on their heads. Their children are shown round the hall, having their Imperial robes and crowns. The young princes hold in their hands the books containing the divine precepts, in the practice of which they have been brought up. The young princesses also hold similar books. The artist has, perhaps, wished to make it understood that not only the male children, but those of the other sex have been initiated in the holy writings, and have taken part in the teaching of Divine wisdom, and that the author of their days, although he was not able, on account of the vicissitudes of his life, to addict himself early to literature, has, nevertheless, wished that his offspring might be instructed, and has also desired that the fact might be patent to all, through this painting, even though it was recorded in history. These are the embellishments which are seen on the four walls as far as the ceiling. This ceiling, which is square in shape, is flat. It is resplendent with gold. The cross, which gives victory, is reproduced in green in the middle. Round the cross the stars are seen, like those which shine in the firmament, and there the august Emperor, his children, and his imperial companion lift their hands towards God, and towards the divine symbol of our salvation."

We should give him more credit for piety if he had not had his benefactor murdered.

105 was the Heliacon of the Lighthouse; it was a vast peristyle forming an atrium to the Church of St. Mary of the Lighthouse and the Chapel of St. Demetrius. It had a doorway at A, sheltered by a porch by which the Sacred Palace is left.

106, the Church of St. Mary of the Lighthouse, became the Imperial Chapel of the Palace after Basil the Macedonian had built the Cenourgion. The main door of the church was of ivory. In the church was kept an enamelled crown of gold and a great cross, the handiwork of Constantine Porphyrogenitus.

107 was the Chapel of St. Demetrius. Here an enamelled image of the Virgin was kept, near the entrance door. The chapel had a trefoiled apse.

108, the lighthouse. In Asia, on the other side of the Bosphorus, was another lighthouse, and there were a succession of them up to the confines of Cilicia. By their means intelligence could be conveyed to the Emperor of the incursions of the Saracens. Polybius describes the way of signalling by means of lights (Polybius, Lib. 10, cap. 43–47).

We must now go back to the Lansiacos (92); the south end of this abuts on 109, the Triclinum of Justinian III.; this was commonly called the Justinianos. It was a covered gallery about 70 ft. wide, and 336 ft. long, running westwards; it was occasionally used for banquets, but more generally for properly arranging the persons or bodies that were going in processions to the Emperor; its west end abutted on a vast vestibule called Scylla (110), one of the entrances from without to the Sacred Palace; from the north side of this vestibule there was a door to the staircase (111), and, on the south side, another to a raised terrace (113), level with the top of the enclosing walls of the Palace; this terrace faced the east side of the great Hippodrome, No. 17. From the end of this terrace ran an open passage southwards to the extremity of the hill (142); the lower part of this was called the Peridromes of Marcian; the upper part was level with the terrace (113), and was called the exterior gallery of Marcian. At the south end of the Peridromes was a chapel built in one of the towers of the wall, dedicated to St. Peter (143), and to it was annexed an oratory (144) dedicated to the Chief of the Heavenly Host; above this was an oratory dedicated to the Mother of God.

The description of the Palace is now completed, with the exception of the outlying buildings, including the Emperor's baths (125). I may here mention that the Porphyry Palace (No. 140) lies to the south, on the shores of the Propontis, and is nearly touched by the north and south meridian of Sta. Sophia when prolonged southwards. It was a small square palace with a pyramidal roof; its walls were wholly covered with slabs of porphyry, brought from Rome, and the floors were also paved with porphyry. This palace must have been dismal, and, one would think, not calculated to promote the health of the imperial scions. On the approach of winter, the Empress used to assemble in it the wives of the great dignitaries, and present them with purple robes. This palace was built by Constantine the Great for the use of succeeding Empresses during their confinement, and those sovereigns who, like Constantine VII., were born there were called Porphyrogeniti. 128 is the new Basilica; 137 the chapel of Elijah the Tishbite; 138 the oratory of St. Clement; 139 the victory of the Saviour.

ROYAL INSTITUTE OF BRITISH ARCHITECTS:

WROUGHT-IRON WORK.

THE eighth ordinary meeting of this Institute for the present session took place on Monday evening last, at 9, Conduit-street, Mr. Alfred Waterhouse, R.A. (President), in the chair.

Mr. W. H. White (Secretary) read a letter from Madame Schliemann, expressing her thanks for the Institute's condolence with her on the death of her late husband.

The Secretary also announced the decease of Mr. Thomas Searancke Archer, Fellow.

Mr. J. Starkie Gardner then read a paper entitled "Wrought-Iron Work: the Mediæval Period," of which the following is an abstract:—

The author endeavoured to establish that the use of decorative ironwork as an architectural accessory originated in England, and was well developed before the Norman invasion, and that almost down to the middle of the twelfth century it was pursued apart from changes in architectural style. Decorative ironwork of this period is distinguished by the use of animal forms and of superstitious symbols; by its crude design combined with skilful execution. The ornament was probably invented by the artisan. Designs associated with late Norman architecture are more refined, and beaten iron foliage is sparingly introduced. French ironwork was at first inferior, and English forms were borrowed: these became extensively modified as they travelled farther from their centre of origin. A peculiar style of open-work hinge was developed with the Romanesque architecture of the South of France. The late Norman period saw the first introduction of grilles or screens of iron into cathedrals. These were at first formed of massive welded scrolls and bars, and subsequently of light scroll-work. The birth of Gothic architecture in France introduced a far higher order of design in the ironwork. The celebrated hinges at Durham and Worksop are the oldest examples of the new style in England, and scarcely appear to be of home production. They are the first to present a modelled surface on the iron, which was struck while hot into dies, as wax is pressed into a seal. This stamped work was exceedingly rich, and culminated in the hinges of Notre-Dame. It reached England some time previous to 1294, when the Eleanor grille was made by John de Leghton, the only smith to whom any stamped work can be attributed with certainty, and to whose hand all the specimens in this country may be attributed. Imitations were made by those who had not learnt the secret of stamping iron. These imitations merged into the simple forms in which fleur-de-lis were so prominent. The art of stamping did not pass into the south of France, Italy, or Spain. It was taken up in Belgium and brought to great perfection, though few specimens exist; but the art was never acquired in Germany, where richly foliated hinges inspired by French examples were beaten out without the use of stamps. A few grilles of Norman design are found in Spain, but nothing else until shortly before the Renaissance. In Italy the oldest grilles were reproductions in iron of originals that were in marble or wood, and of Eastern origin. Early in the fourteenth century the quatrefoil grilles appeared in North Italy, and for a time superseded all others; but after about a century iron was again generally replaced by bronze or marble in that country. These quatrefoil grilles, together with other varieties taken from Eastern joinery, found their way through France eventually to England, and, with the imitation of architectural form in iron, led probably to the marked decay of smithing apparent in both countries. The Flemish, and particularly the Brabançons, led by the Matsys, took up the craft with great vigour; and while little was made in England except the railings of perpendicular bars, which formerly crowded Westminster Abbey and Canterbury Cathedral, some very important works, such as the St. George's Chapel and the Ely gates, were exported to us from Flanders. Iron was also first used on a large scale for constructive purposes in roofs and spires in Bruges, Ghent, and Antwerp. The beautiful locks and caskets, with carved iron figures and tracery, originating in Brussels and Louvain, were produced in France with far greater intricacy and refinement of design, and led to a magnificent revival of the smiths' art in that country. The Belgian style was also welcomed in Cologne and in all the frontier towns, and profoundly stimulated and impressed ironworking in Germany. The Cologne ironwork consists at first of poorly-executed tracery associated with a pierced ornament taken from the thistle. This latter became so popular that German smiths used it universally and modified it in every direction, to the exclusion of the vine, which, borrowed from French work, had until then reigned supreme. The thistle, associated with lattice or debased tracery grilles, held its place until the Renaissance, when still richer forms, like the Passion flower and the peculiar interlacing work, displaced it. While the transition saw smithing in its highest perfection as a national art in Germany, and the birth of a still more magnificent development in Spain, it witnessed its complete decline in England, France, and Italy.*

Mr. William White, F.S.A., in opening the discussion, said he was glad to have the opportunity of expressing his great obligations to the lecturer for bringing together such an interesting sketch of the history of "Art Iron-Work." He was not quite sure, however, that he agreed in all the conclusions which had been brought forward by Mr. Gardner. He had come across some very fine specimens of mediæval iron-work at Siena, Florence, and other places, which, though not of a very elaborate nature, were at the same time very good. He well remembered one of the doors, which had iron bands, locking by three or four successive locks, passing over each other, and affording very great security. In Switzerland there was a considerable amount of ironwork of the later kind, but following closely on the mediæval precedents. At Lucerne, a fine screen was to be found in the cathedral. Reference had been made to the Danish ironwork, and he remembered seeing at Copenhagen a wonderful piece of ironwork, round a balcony on the Church of the Holy Trinity. This, he believed, was sixteenth-century work, every panel being about the size of a small hurdle, with different patterns in almost every case. Mr. White concluded by proposing a vote of thanks to Mr. Gardner for his valuable paper.

Mr. Charles Fowler, in seconding the motion, referred to the characteristic iron-work of South Germany, ranging up towards the end of the sixteenth century. Its peculiar characteristic was that the scrolls were intricate. They made a great number of turns, but a little leaf-work was introduced. This ironwork was entirely made with round iron, threaded at the intersections, but not welded there. The panels were almost invariably crossed by diagonal rods, which passed through several scrolls, with a great many turns. The effect was peculiar, and it might be classed almost as a style by itself. He remembered some elaborate screens,

* The paper was illustrated by a large number of interesting illustrations shown by means of the oxyhydrogen lantern. Some of these illustrations, viz., doors to cloister, Durham Cathedral; door of Chapter-house, York Cathedral; and wrought-iron hinges at St. Mary's, Norwich, were published in the *Builder* for May 11, 1889, together with a previous paper by Mr. Starkie Gardner, read before the Architectural Association.

at Augsburg Cathedral, formed in this way, and the style, no doubt, was well-known to those who had travelled in Southern Germany.

Mr. James Neale, F.S.A., said he was sorry that they had not had an illustration of a well-known hinge in the south transept of St. Albans. The last time he was there he observed it thrown on one side in the churchyard, and going to decay. It had, unfortunately, been stowed away by a very eminent amateur, who very likely substituted something else for it.

Mr. Ralph Nevill, F.S.A., said he was very pleased to hear the lecturer ascribe the origin of the early wrought ironwork of this country to the Norsemen rather than to the Celts, of whom people heard so much nowadays. It was pretty well admitted that the art came in with the Norsemen and Danes, who had acquired it through their intercourse with Byzantium and the East. Mr. Gardner had referred to a subject which ought to cause no inconsiderable shame,—namely, that there was only one reproduction of an English hinge at the South Kensington Museum. Those who had studied there in the old days knew that there were a great many German works at the Museum, some of a very curious character, and some exceedingly ugly and undesirable to be placed before students, although they were very considerable specimens of skill in the use of metal. It was a shame, he thought, that English art was not exhibited by the authorities at South Kensington, because it certainly was equal to any art in the world. It was more suited for founding the new English art upon, and for English artisans to get their ideas from. Instead of that, however, they found specimens of foreign work scraped together from all countries. It might be said that Englishmen could go and see English art, and not foreign art; but that was not the case, because workmen and students could only to a small extent inspect the specimens of English art scattered throughout the country. He should like a determined effort made to get together a good collection of English art, and he ventured to hope that the book Mr. Gardner was preparing for South Kensington (although no doubt he would give a great many specimens illustrating the arts of foreign countries) would yet contain still more specimens of English art, which he (the speaker) ventured to think, was quite equal to anything which was to be found abroad.

Mr. H. H. Statham remarked that one thing which must have struck every one in the long series of illustrations they had had that evening, was the almost entire absence of anything like realistic treatment of natural forms. He was on the look-out for it during the whole evening, seeing that specimens were brought from various schools and dates, but they had scarcely a bit of it until they came to the big German thistle. In most examples produced there was simply the treatment of iron-work in scrolls tangential to each other, with a principle of growth, but without any imitations of natural forms. Now that was, he considered, one of the lessons to be learned from these examples, and it was a lesson which seemed to be very much wanted in the present day; because when the German took to great lumpy foliage and realistic thistles, he, at all events, did it consistently,—it was realistic as much as he could make it. But what had very much struck him in recent iron-work, even in places where they might have expected to find the very best taste, was that people were found designing a very admirable piece of iron-work, as it first appeared, entirely free from realism, but they could not apparently get rid of some of the little realistic leaves and tendrils, which they would stick in somewhere. He had seen it even at the "Arts and Crafts," which was supposed to be the home of pure taste in decorative art. Now, that was what he could not understand. He could understand a man going in for absolute imitation of foliage in wrought iron-work,—he was a miserably-misled man if he did, because it was a horrid thing to do—but he could not understand a man avoiding realism entirely for the greater part of his work and then going and spoiling the whole thing by sticking in it a bit of realistic fruit and flower. That was joining together two methods of working which had no relation to each other in any way, and it was so often seen in the revived wrought iron-work of the day that anyone who felt strongly on the matter should exhort those who were designing and executing iron-work at least to keep their work in one plane, so to speak; that when they avoided realism and went in for pure design they should leave it so, and not spoil it by putting in those stray bits of natural branches which disappointed and annoyed people when they were in the enjoyment of a fine design.

Mr. Langton Cole supported the vote of thanks, and asked Mr. Gardner if he had altogether abandoned the theory which he enunciated in his paper read before the Architectural Association two years ago,—that in the Early Gothic period England had led the way in wrought-iron work? At that time, indeed, Mr. Gardner had suggested that it was extremely probable that the great doors of Nôtre Dame were English. He pointed out that they were generally attributed to the devil, but that it was believed they came from England, and as they were a very fine piece of work English architects were naturally very proud of them.

The President, in putting the motion to the meeting, said he entirely agreed with what the speakers had said as to their indebtedness to Mr. Gardner, and he only hoped that that gentleman would favour them with another paper on iron-work. It was interesting to hear Mr. Gardner say that the screen, Westminster abbey (tomb of Henry V.), was looked upon as one of the most satisfactory specimens of iron-work in existence. It had always appeared so to him, and he was pleased to learn that there were many examples of the same class of work, and, probably, by the same hand, in this country.

The vote of thanks was then put and carried by acclamation.

Mr. Gardner, in replying, said he was at present engaged in making a copy of the grille at Winchester Cathedral, in front of St. Swithin's shrine, for the South Kensington Museum, and he was trying to make the copy so as to reproduce all the different accidents of smithing which occurred in the original, so that the copy should be a faithful one. It was certainly the earliest type of a grille known. It was the rudest, and it occurred in association with very early buildings in many places in France and Spain; while the more simple Lincoln type, with its monotonous scroll, was always associated with later work. The Lincoln grille used to be described to every visitor by the verger as being of 1490 date, but this was so obviously ridiculous that he got one of the canons to look into the matter, who found that the date had been misread, and that the passage relied on related to the removal of some other iron-work, and not to the erection of any. In reply to Mr. Fowler, he had stopped short at the Renaissance. His subject terminated before the work of that period began. Mr. Neale might be glad to know that two of the hinges, engraved in his work on St. Albans, were in the South Kensington Museum. He had mentioned in his lecture that he was instrumental in obtaining them from St. Albans for the Museum. He most cordially endorsed everything Mr. Statham had said. In his (the speaker's) lecture in Birmingham at the Art Congress, a few months ago,* he took for his text that they should not introduce realistic foliage into design, nor take their subject straight from Nature. He had found, in designing, that one could not go to Nature and use the crude forms to be found there. However beautiful they were in themselves, when deprived of life and of the charms which surrounded them, and put as mere dead forms, they always seemed more or less out of place. In his early days he used to think that the right thing was to imitate the oak and other leaves, and introduce them into iron-work, and when there was little doing he designed and had made for stock leaves and shells and other things which he thought would come in some time or other in works to be executed. He found, however, that it was impossible to use them readily, as they had to be very greatly modified, softened down, and idealised to be of any use. The idea that more attention should be paid at South Kensington and the other museums to English art was one with which he cordially agreed. When foreign visitors went through the English museums, and saw no rooms devoted to English art, they could only go away with the impression that the English had no art, or they would be glad to show it. When, however, they visited France, Italy, and Germany, they did not see the art of other countries put forward in the most prominent places; but first the art of the particular country, and then the national collections, were supplemented by specimens from other countries. He hoped sincerely that they would see the day when the largest and finest rooms in South Kensington and the British Museum would be given up to the collections of English art. Many of the phases of English art were not even alluded to in the text-books, and one could only discover them in some of the mansions or out-of-the-way places where the collections were scattered over England. As to Mr. Cole's question, he (Mr. Gardner), as stated in his paper, had recanted the particular views referred to, and had now come to the conclusion that he was then on the wrong track. In conclusion, he would like to impress upon all interested the necessity for preserving these fine old examples of hinges, which were passing away every day. In one case he could name, a fine hinge was so loose that that any one could take the whole of it away in a carpet-bag if he chose. The least they could do, then was to take rubbings of them, or, better still, paper casts, which was a very easy process.

The President then announced that the next meeting would take place on the 2nd proximo. The meeting would be a special general one to elect the Royal Gold Medallist for the current year, and a business meeting for the election of new members, after which Mr. Somers Clark would read a paper on "Seville Cathedral."

* See *Builder* for December 27, 1890, p. 492.

THE ARCHITECTURAL ASSOCIATION VISITS:

NEW BUILDINGS ON THE EMBANKMENT.

The first visit of this Session brought together, on the afternoon of Saturday, the 14th inst., a large number of members for the purpose of inspecting Messrs. Hobbs & Co.'s newest example of colossal construction, of which Messrs. Perry & Reed are the architects, which will shortly occupy the place of, and also completely obliterate, Salisbury and Cecil-streets, Strand. The scheme provides for the erection of three large blocks of buildings, two of which will be at right-angles to the Strand, with a carriage roadway between, whilst the third block adjoins the Savoy Hotel, and faces the river and the Embankment gardens. The roadway will be approached by the old entrances of Salisbury and Cecil-streets, whilst the block of houses in the Strand will remain to screen the new settlement from the heavy traffic of the main thoroughfare.*

The question of foundations, which in this case was an important one, excited much interest; the piles upon which the old and comparatively light buildings had rested, with a 4-in. plank between, were being replaced by solid masses of concrete, 30 ft. thick and in some cases 16 ft. broad, to receive the new structure. The western block of the two first mentioned, has just been begun, and for that purpose within the last few weeks Salisbury-street has nearly disappeared; whilst the entire destruction of Cecil-street must precede the erection of the eastern block. These two blocks will consist of flats and a small theatre. The south block will be devoted to hotel purposes. Owing to the slope of the ground, the basement, containing the offices and servants' sleeping chambers, though below the road-level on the north, will be well lighted above ground on the south. The ground-floor contains dining, billiard, and reading rooms, with reception-rooms on the first-floor. A main staircase and two subsidiary ones connect all the floors, and there will be, in addition, two passenger-lifts. The bed-room floors have two areas for light placed in the centre of the blocks, and for ventilation and light two shafts will be formed under the domes at each end of the structure.

The elevations are treated with red brick and Portland dressings, above a basement with a battering and rusticated face. We are inclined to regret the placing of such a massive and lofty building in its present position, where it will stand out of line with and overbalance most adjoining buildings, and hide a portion of the Adelphi-terrace viewed from Waterloo Bridge. The position of the hotel block, standing, as it does, quite detached from all other buildings, necessitates adequate arrangements for escape in case of fire, and these, no doubt, will be provided, in addition to the security afforded by fireproof floors and stone staircases.

* We gave an elevation of the river front of these buildings, together with plans and a small section, in the *Builder* for October 20, 1888, pp. 285, 286, together with further particulars relating to the scheme.

Illustrations.

DESIGN FOR A STAIRCASE FOR A TOWN MANSION.

THIS design, by Mr. A. Mackintosh, is the one to which the Tite prize was awarded this year by the Council of the Instituet of Architects. We commented on it in a short article on the students' designs in a previous number.

It is only necessary to add here that the figures in the spaces on each side of the circular windows were intended to represent Morning and Spring; Day and Summer; Evening and Autumn; Night and Winter.

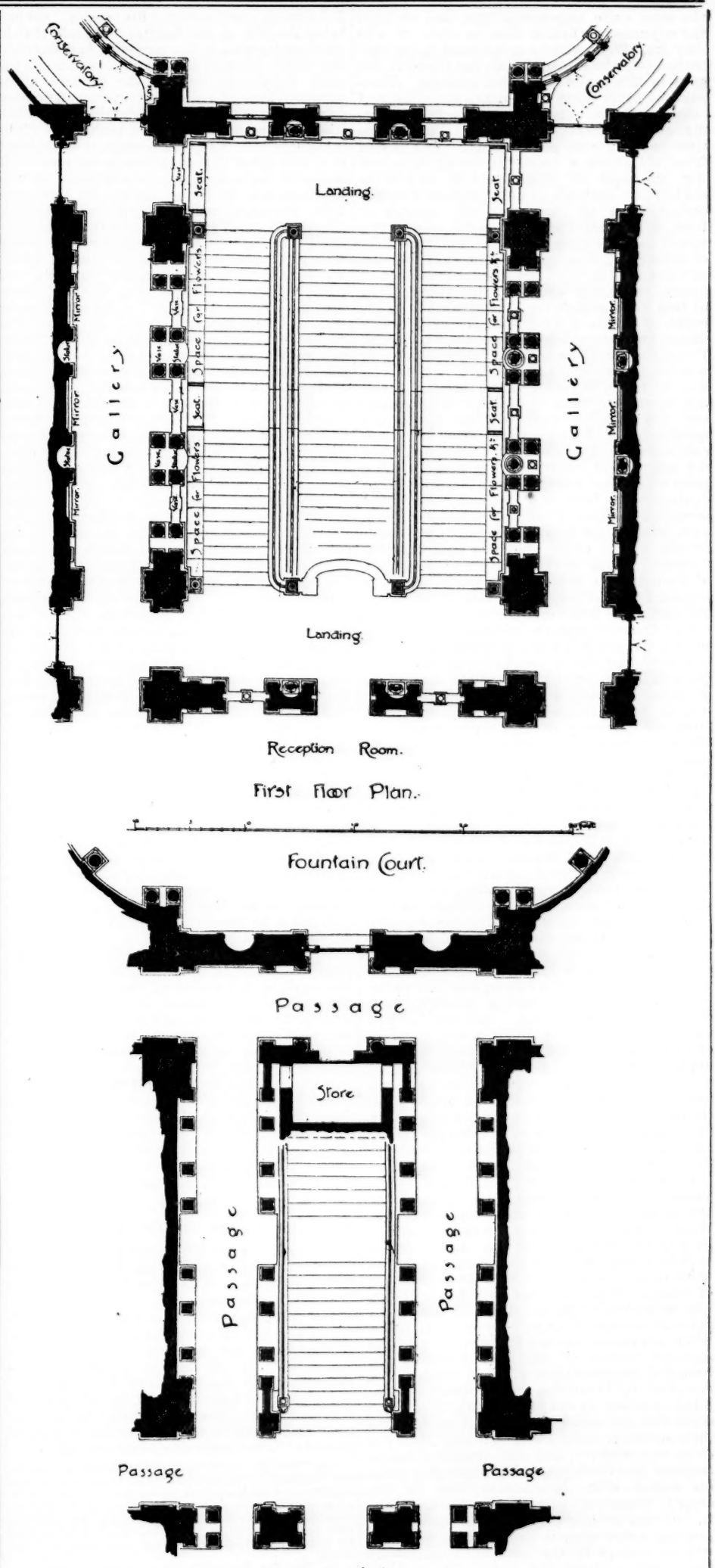
THE IMPERIAL PALACE AT CONSTANTINOPLE.

THIS plan of the ancient Byzantine Palace at Constantinople is introduced as an illustration of Professor Aitchison's Fourth Royal Academy lecture which is printed in this number, and in which the plan is fully described.

LECTURES AT UNIVERSITY COLLEGE.

ON Monday, the 9th inst., Mr. W. St. Chad Boscawen gave the fourth of his lectures, the subject being "Art and Religion." He began by saying that in a mixed civilisation, such as that of Babylonia, it was certain that the varied myths and legends would soon find expression in art. Among our earliest, smallest, and at the same time most important relics, of Babylonian civilisation, were the little cylinder seals. These objects formed a very important class, and corresponded in Babylonian art to the coins and painted vases of classical archæology. The manufacturers of these objects derived their inspiration from the current myths of the people, and we therefore have the earliest illustrations of many of those myths in Greek mythology which had been transmitted to the West through Phœnician and other sources. Mr. Boscawen then proceeded to describe some of the chief myths which were illustrated upon the gems. The principal source was to be found in the epic of Gizdhubar, a work in which the numerous Volklieder of Chaldea had been collected, probably about B.C. 2000. This work was one of the most important storehouses of mythological material; based upon a solar myth, there had been woven into it a large number of legends of much greater antiquity than the epic itself. Among the stories we find almost all the episodes of the labours of Heracles. His struggle with the lion, with the man-bull, the Cretan minotaur, his visit to the garden of the Hesperides, his sickness and wearying from the poisoned garment of Nessus, are all found in this poem. Mr. Boscawen then showed how these legends had come to Greece by two channels, one series by a Phœnician and Cypriote intercourse, the others by the Hittite road through Asia Minor. To the former belong the legends of the Babylonian goddess of love, Ishtar, while by the northern road another series, grouped around the Asiatic warlike mother-goddess, appeared in the West in the tales of Artemis and the Amazon queen, Omphale. The lecturer then gave translations from several inscriptions illustrating these legends, and showed how many of them, which had hitherto been inexplicable by the old canons of Aryan mythology, became perfectly clear in the light of the mythology of Babylonia. One of the most remarkable results of this new material was the clearing up of many of the cycles of Greek and Western Asiatic myths. Mr. Boscawen next showed how new and important a light the discoveries in Babylonia, and the discoveries in the land of the Hittites, threw upon that most important series of legends of the Asiatic mother-goddess. The Ephesian Artemis was but another form of the full-breasted Hittite goddess, whose statue was found at Carchemish, and of the Babylonian Ishtar-Nana, the nursing mother of all nature. The lecture was concluded by a remark that many of the symbols upon the coins of Asia Minor, especially of Ephesus, were replicas of the token marks of the Asiatic goddess.

Prof. Poole, on Thursday, the 12th inst., delivered his third lecture on Greek art. After recapitulating some of the statements he formerly made, he drew special attention to the fact that in the ascendency of Athens (478–404 B.C.) the arts were united, while sculpture ruled painting, and had strong influence over architecture. All the men and women—gods and goddesses—have



Design for a Staircase ("Tite Prize"). Plans.

the same quite impersonal type, and we need the adjuncts we find in them to show us who they are. Phidias had a great hand in the Parthenon,—in the eastern frieze, the frieze of the gods in the centre, and other portions. Vase-painting dates thirty years before sculpture, and coins twenty years later. The epoch of painting extends from 404–330 B.C. During this time painting was predominant. The period from 404 shows a decline in sculpture (which was the work of inhabitants of Greece or the Grecian Islands), and the painters who succeeded seem to have been all Asiatics or from Asia Minor, Ionia, and Mysia, and accustomed to skies more brilliant even than those of Greece. The art of painting was developed at this period to the highest point ever reached before the time of Raphael. We have nothing of this work, except the reflection of it in the relief, by Zeuxis, of a Heraclea, probably in Asia Minor, and feebler workers, are thus traceable. From 404-352 there were no great sculptors. Apelles flourished at the end of this time; he was the favourite painter of Alexander. About 352 Scopas and other four sculptors appeared; and the greatest work of that age is the mausoleum of Halicarnassus. The two main points are the splendid Ionic tomb within, and the magnificent quadriga at the summit. It is plain that there was rivalry in these works, as distinguished from the harmony and consecutive character of the Parthenon. There is here, on the other hand, individuality and great excellence and charm, but very little consecutiveness. Pithis was the author of the statue of Mausolus on the summit, while Scopas is supposed to have erected the side which faced the east. The latter sculptor is by us moderns placed first, although the ancients put him only second. There is one nearly perfect portion of the frieze, and that is, the charioteer, whose expression is wonderful. Prof. Poole then spoke of some peculiarities in the later sculpture,—*e.g.*, the deeply-recessed eyes, as distinguished from the perfectly natural representation of the older works. The stronger lines seem to have been due to the necessity for emphasising peculiarities. The mind is not *rested* by the Mausoleum work as it is by the harmonised work of the Parthenon; it is rather agitated by the variety and peculiarities. Praxiteles, 340 B.C., worked on the temple of Ephesus, of which we have some small remains. In his and other works of the time we discover a wonderful knowledge of anatomy, remarkable for the age. One statue of his (which Prof. Poole said he thought was not sufficiently admired) was that of Demeter or Ceres, which is in the vestibule of the Græco-Roman room in the British Museum. On the face there is intense sympathy, and if we found that face in a Roman Catholic cathedral we should have said it was the finest Madonna ever delineated. But the body is very inferior; and the lecturer suggested, to explain this, the bold hypothesis that the people of Cnidus (like those of Cos), being impoverished, implored Praxiteles to execute, at least, the head, lest the goddess should be angry, while the rest of the work was carried out by another. Prof. Poole pointed out a remarkable peculiarity about the Venus of Milo (250 B.C.), which you think is half-a-head taller than it is because of the increased size of the arms, &c.; while the Venus de Medicis appears, from its prettiness and affectation, less by about 5 in. than it is. When Alexander formed a Court he headed it by a Queen, and the result was that the nobles became monogamous within thirty years, and we have several women in that time possessed of great political excellence and private virtues. The terra-cotta ornaments show the taste of the period, the subjects being chiefly women and girls, while the earlier showed an excess of athletes. Another feature of the later works is the beautiful representation of little children (on the group by Praxiteles, on the other hand, the infant is a blot on the production). Prof. Poole concluded by drawing a parallel between the great sculptors and poets of that age; Æschylus (who was reserved, and had large and simple majesty, like Phidias, nothing distressing about his scenes—even Agamemnon dies off the stage); Sophocles (who takes nature as he sees it, and has infinite pity); and Euripides (who presents a new type, is cynical, and with him women—except in the case of Alcestis—are not raised to their due level). He was the great favourite of the vase-painters. The next lecture will be on the Local Schools of Greek Art.

On Monday last Mr. W. St. Chad Boscawen gave the last of his series of lectures on Babylonian archæology, his special subject being the Rise of the Semites. He said that in previous lectures in this course he had sketched the chief features of the civilisation of the early Babylonian empire, the product in its primitive form of a plodding, inventive Turanian people. It had gone on developing within itself, and with the exception, perhaps, of slight influences from Egyptian sources, it was subject in a very minor degree to foreign influence. It seems to have a curious resemblance to the developments in Egypt under the IVth and VIth dynasties, when Egypt was, indeed, "Egypt for the Egyptians." In the same way there was very little trace of contact by war with any other country except that of Elam. We cannot tell for how many centuries this state had lasted, or how long it would have continued had it not been for the introduction of a new and progressive element. This was to be found in the warm-blooded and keen-minded Semites, who, attracted to the rich pasture-lands of Babylonia and to the markets of the cities, soon saw in the new civilisation with which they were brought in contact much that delighted them. Mr. Boscawen then proceeded to show how the inscriptions revealed much of the early life characteristics of these people. Living a nomad life, restlessly wandering, and engaged in constant tribal wars, they became under Babylonian influence a very powerful factor in propagating this civilisation. The annual tribal movement found its outlet in the annual war which to some extent in Babylonia had been established, but which was a great State institution in Assyria. It was curious to observe how this movement northward was stamped on the Tigro-Euphrates Valley, and that which is the characteristic feature of the life of the tribes of the Shamar and Anezeh of the present day, of moving northward with the heat was found to have existed from the earliest time. These Semitic colonies at Sippara, Assur, Calah, Nineveh, and Horan, form, as it were, so many milestones on the route. Mr. Boscawen then proceeded to describe the great influence the Semites exercised in trades and illustrated it by quotations from several early inscriptions. They simplified the writing in Chaldea as they did in Egypt, and in religion they effected an entire reformation of the Pantheon. They rapidly analysed and adapted, and finally spread abroad, through Northern Mesopotamia, Syria, and Palestine, that which they had learned. It was to this Akkadian and Semitic culture that we owe the marvellous civilisation of Assyria. It was a mixed product. There were many elements in it (indeed, all the ground work) which were Babylonian; but its powerful influence, spreading on the banks of the Tigris to the shores of Greece, was due to the restless wanderings of the Semite. In conclusion, Mr. Boscawen said that to understand the civilisation of Assyria it was necessary, as he trusted he had in some degree succeeded in doing, thoroughly to expound the wonderful development in all branches of the culture of ancient Chaldea. To understand Greek Art, Greek mythology, it was necessary to understand the art, religion, and civilisation of the great colony of the mother country Babylonia. He hoped that this link in the chain would be supplied by a future series of lectures

THE LONDON COUNTY COUNCIL.

THE ordinary weekly meeting of the London County Council was held on Tuesday last at Spring-gardens, the Chairman (Sir John Lubbock), presiding.

The Blackwall Tunnel.—The Bridges Committee brought up a long report on this project, setting forth the opinions of Sir Benjamin Baker and Mr. Binnie (the Engineer to the Council), as to the feasibility of the scheme, and a number of reasons why, in the opinion of the Committee, this communication, so long promised, should be proceeded with as soon as possible. The Committee recommended:—

"(*a*) That the Committee be authorised to instruct the Engineer to prepare drawings, specifications, and conditions of contract for a tunnel not more than 27 ft. external diameter, and not less than 23 ft internal diameter, provision being made therein for vehicular and pedestrian traffic, and that tenders be invited by public advertisement for the construction of the works.

(*b*) That the Committee be authorised to empower the Engineer, in preparing such drawings, specifications, and conditions of contract, to consult Sir B. Baker, K.C.M.G., and Mr. J. H. Greathead, M. Inst. C.E., as may be found desirable.

(*c*) That it is not desirable to proceed with the provisional works of sinking a shaft as authorised by the Council.'

Mr. Osborn, Chairman of the Bridges Committee, having moved the adoption of paragraph (*a*),

Mr. Rhodes moved, as an amendment:—

"That, as it appears on high professional authority that in the present stage of engineering science and practice it is not practically possible to construct under air pressure a tunnel at Blackwall of a larger external diameter than 27 feet, or a larger internal diameter than 23 feet; and as it also appears that such dimensions will not satisfactorily and properly afford space for foot passengers in addition to adequate space for two lines of vehicles, it becomes essentially desirable to carefully reconsider the whole question, both in its financial and other relations, and also alternative means of effecting required transfluvial communications of a kind shown by experience to be, probably, easily practicable and comprehensively effective; and that therefore the report be referred back for further consideration."

The amendment was seconded by Mr. Myer, and, after a long discussion, was negatived by 67 votes against to 28 for. The further consideration of the subject was then postponed.

The London Water Question.—The Council next proceeded to consider a special report of the Parliamentary Committee upon the London Water Bills now before Parliament, in so far as it recommended the Council to oppose those Bills. After some discussion it was resolved—

"That a petition be presented to Parliament by the Council in opposition to the Metropolis Water Supply Bill, and that the Council do oppose each of the following Bills, against which they have presented petitions, that is to say—

The London Water Commission Bill.
The Southwark and Vauxhall Water Bill.
The Croydon Water Bill.

and that the costs and expenses of and incidental to the said petitions and the proceedings consequent thereon be charged to and paid out of the County fund."*

After transacting a great deal of other business, the Council adjourned.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—On the 16th inst., Mr. J. S. Corder, of Ipswich, read a paper on "The Timber-framed Buildings of East Anglia," before the Leeds and Yorkshire Architectural Society. Mr. Corder exhibited a large number of sketches made by himself of some of the best specimens of existing buildings of the kind in the Eastern Counties. Mr. W. H. Thorp, the President of the Society, was in the chair, and a vote of thanks was given to Mr. Corder.

MANCHESTER ARCHITECTURAL ASSOCIATION.—The last ordinary meeting of this association was held at the Manchester Athenæum, on the 17th inst., Mr. T. Chadwick, President, in the chair. A paper was read by Mr. J. A. Gotch, F.R.I.B.A., on "The Renaissance in Northamptonshire," illustrated by numerous views by an oxy-hydrogen lantern. A vote of thanks, proposed by Mr. Stelfox, seconded by Mr. Woodhouse, and supported by the Chairman, was accorded to Mr. Gotch for his paper.

YORK ARCHITECTURAL ASSOCIATION.—A paper on "Building Legislation" was read on the 12th inst., before the York Architectural Association, in the York Church Institute, by Mr. J. Spencer Yates, Assoc. M.Inst.C.E. Mr. Pollard, the President, occupied the chair. The paper dealt with the many advantages resulting to the inhabitants of cities and towns from efficient building laws providing for more efficient construction and sanitary arrangements of our dwellings. The model by-laws of the Local Government Board were in their general effects criticised. The discussion was taken up by the President, Mr. Monkman, Mr. Penty, Mr. Hepper, and Mr. Pegg, and a vote of thanks was accorded to Mr. Yates for the paper.

GLASGOW ARCHITECTURAL ASSOCIATION.—The usual monthly meeting of this Association was held on the 10th inst., the President, Mr. Wm. J. Anderson, in the chair. A paper on "Scottish Baronial" was read by Mr. Charles R. M'Intosh, who prefaced the historical review of the style with a commendation of the claims it has on architectural students as exhibiting standard models of picturesque grouping. To the Scot it should appeal with the added force of national association. Divided into five periods averaging a century each, the typical castles of Scotland were detailed. The essayist showed a series of illustrations of the more important of the buildings instanced.

DUNDEE INSTITUTE OF ARCHITECTURE.—On the 12th inst. a lecture was delivered in the Y.M.C.A. Hall, Dundee, under the auspices of

* We intend shortly to give an analysis of the main provisions of these Bills, and of the London Water (Meter) Bill and the Metropolitan Water Companies' (Charges) Bill.

the Dundee Institute of Architecture, Science, and Art, by Mr. William Norwell, painter, on "Decoration in relation to Architecture." Mr. C. Ower, who presided, briefly introduced the lecturer.—Mr. Norwell began by enlarging upon the close relationship between architecture and decoration, saying that it would be incongruous to speak of them apart. According to the report in the *Dundee Advertiser* he described the remnants still existing of Greek and Roman decoration, and alluded to the developments of decorative work during the Renaissance period and subsequently. Speaking of the decoration of architecture in Scotland, he mentioned the chapel at Glamis Castle as a fine example of the decorative art of the seventeenth century. In the quaint old Church of Fowlis are some of the most artistic decorations of their kind in Scotland. The ceiling of the great hall in the mansion of Earslhall, at Leuchars, is finely painted. The tower at Collairnie, in Fifeshire, has also decorative inscriptions, and the old Palace of Culross is distinguished for its decorated ceiling and walls painted in *tempera*. The Palace at Falkland still shows on its ceiling fragments of the original painting and gilding. Talking of the decoration of old buildings in Dundee, Mr. Norwell said:—In a building in Rankine's-court, recently removed to make way for an extension of Mr. Keiller's confectionery premises, were discovered in what had been a dining-hall the remains of a decorated ceiling. On the beams were painted inscriptions taken from "Quarles's Emblems," and on the spaces between were flower and fruit subjects in *tempera*. An example of this *tempera* work may be seen in the Dundee Museum—part of a decorated roof taken from a house that stood in the Nethergate, and which belonged to Alexander Wedderburn, at one time Town Clerk of Dundee. The house at the corner of Thorter-row and Nethergate, once the town residence of the Gowrie family, was also elaborately decorated in this way. In concluding his address, Mr. Norwell said that good work must be fairly remunerated. A standard of high excellence would require to be established and recognised. While eye-service should be discouraged on the part of workmen, it was also necessary that the masters should be upright and exemplary. Clients, from a mistaken notion of present gain, sacrificed the stability and finish of their work in a way that no after outlay could put right. Scamped work was not cheap at any price. Frequently he was expected to produce high-class decoration on unworkmanlike productions of other crafts, on surfaces altogether inadequately prepared for high-class treatment. For this he did not blame the members of the other building trades. It was the system that was at fault in these days of cheap and hasty work.

COMPETITIONS.

AYR FREE LIBRARY.—In the competition for the Carnegie Free Library, ten sets of plans were sent in, and those submitted by Messrs. Campbell Douglas & Morrison, of Glasgow, have been placed first. The design of Mr. David Sturrock, Glasgow, was placed second, and that of Messrs. M'Arthy & Watson, Edinburgh, third. Dr. Rowand Anderson, of Edinburgh, acted as professional assessor to the Library Committee.

PETERHEAD FREE LIBRARY.—At a meeting of the Peterhead Town Council, on the 9th inst., a report by the Free Library Committee came up, in which the plan of Mr. M'Millan, Aberdeen, was recommended by nine votes to seven given for the plan of Messrs. Matthews & M'Kenzie, Aberdeen, both being estimated on a basis of 3,000*l*. A discussion took place over a motion by Provost Smith to agree to the purchase of a suitable site at the corner of Queen-street and St. Peter-street at a cost of 1,000*l*., and to adopt Mr. M'Millan's plan. Mr. Gray moved delay for a month. Mr. M'Millan's plan was ultimately approved, and the work was ordered to be gone on with without delay.

NEW CHURCH, LEIGH WOOD, CLIFTON.—We understand that the design submitted by Mr. John Medland, of London, in the competition for a new church at Leigh Wood, Clifton, has been accepted by the Committee.

ST. ANDREW'S CHURCH, EXMOUTH.—We are informed that the committee have awarded the premiums in this competition as follows, viz.:—(1) Messrs. Paul & Cogswell, London, W., and (2) Messrs. Phillips & Holdgate (design No. 2), Newport (Mon.). *Proxime Accessit*, Mr. H. Wilson, London. There were fifty-five designs received. The assessor was Mr. G. H. Fellowes Prynne, A.R.I.B.A.

FREE LECTURES TO ARTISANS AT CARPENTERS' HALL:

PROFESSOR ROBINSON ON "SANITARY AND INSANITARY DWELLINGS."

THE first of the present series of free lectures to artisans and others was delivered on the evening of Wednesday, the 11th inst., at Carpenters' Hall, London-wall, by Prof. H. Robinson, M.Inst.C.E., his subject being "Sanitary and Insanitary Dwellings." The chair was taken by Sir John Coode, K.C.M.G., who briefly introduced the lecturer.

Prof. Robinson said that "Sanitary and Insanitary Dwellings" was a subject which he had the greatest pleasure in lecturing upon, because he had always felt, independently of his professional connexion with sanitary matters, how important it was to struggle against the apathy which existed to such a large extent amongst the public, and to endeavour to give some information which would guide everyone in the simplest arrangements of their houses, upon the healthy condition of which depended the lives of those who were dear to them. Last year in London there were 2,276 deaths from preventible causes,—namely, fever and diphtheria. One important point to observe in choosing the site of a house was that it should be free from damp, and be so situated as to prevent other houses being constructed so as to in any way interfere with the current of pure air around and within it. He emphasised the necessity of having the whole basement of a house erected on wet subsoil concreted to prevent the possibility of the damp rising, remarking that the presence of damp in a house was a fruitful source of disease, and in some cases alone caused diphtheria. The construction of a dry area in addition to a damp course in the wall was also essential. In a great number of very beautiful mansions the construction of windows was not carried out with due regard to the proper admission of the rays of light from heaven. One point, therefore, to bear in mind in building a house was not to exclude the light of the sun. The lecturer proceeded to point out some of the causes of the pollution of the air. One of the ordinary causes, he stated, was the respiration from the human beings occupying the house; others were the non-removal of refuse from the immediate neighbourhood of the house, the existence of old cesspools or old receptacles for filth, which very frequently were permitted to be covered up and hidden during the construction of a house, and the fact of a house being sometimes built upon what was called a "made" soil. He had seen, within five miles of where they were then assembled, low-lying land filled up with all sorts of refuse by those who ought to have been prevented by the authorities. In years afterwards that land was built upon, and, as a matter of fact, was a constant source of pollution to the air immediately surrounding it. The ordinary methods of removing foul air were by having a Tobin tube or opening in the window, and a fireplace. There was a great want of uniformity amongst the building by-laws issued by local authorities. They partially met the points to which he had been referring, but not sufficiently. At the present time a great number of houses were built without provision for fresh air, which was so necessary. He had had occasion during the last twenty years or more to inquire into the causes of a good many outbreaks of disease which he regarded as preventible, and he had become more and more convinced that there was a certain class of people who did not feel any repugnance in building a house improperly, knowing that all the elements of danger to life existed. He always looked upon a jerry-builder as a man whom he would like to hunt out of society. Some years ago he suggested that it would be a good thing for every local authority to keep, and to open to the public a death-chart, or a map indicating by a red or black spot where any fatal case of typhoid or preventible disease had occurred. In the course of a few years such a record would tell its own tale. Besides the purity of the air, one very important point was, to take care about the water supply of a house. Although water when delivered from its source might be free from pollution, it very often became polluted afterwards in various ways. One of the commonest ways was the fact of people allowing their cisterns to be exposed to the air. He exhorted his hearers to see that their cisterns were cleaned and covered up properly, and, in conclusion, pointed out the necessity of having the drains of houses overhauled and tested before they were occupied, and the desirability of having the drains so constructed as to ensure the speedy removal of the fluid refuse.

At the close of his lecture the Professor received a very cordial vote of thanks.

The second lecture of the series was delivered by Professor T. Roger Smith, F.R.I.B.A., on Wednesday evening last. Mr. A. Waterhouse, R.A., P.R.I.B.A., presided, and briefly introduced the Professor, who lectured on the "Failure of Buildings." There was a large audience.

Books.

The Chemistry of Iron and Steel Making. By W. MATTIEU WILLIAMS, F.C.S. London: Chatto & Windus.

THIS treatise may be regarded as intermediate between those usually classed as "popular" and those that are severely technical. Mr. Williams of late years has been better known as the author of popular science articles in the magazines than as a technical writer, but this little work testifies to his considerable knowledge of the subject under consideration. It is a pity that the author has not more thoroughly re-written the various chapters which too often are simply articles and controversial letters taken pretty much as they stand from the various periodicals in which they first saw the light. The result is a somewhat irritating want of coherence. As the work is avowedly one on "The Chemistry of Iron and Steel Making," the reader is apt to feel not a little disappointed at finding himself inveigled into reading somewhat stale controversies and expressions of Mr. Williams' opinions, and at finding more recent matters of interest, such as the Gilchrist and Thomas Basic process for the elimination of phosphorus, and the Bower-Barff process for protecting iron from oxidation, dealt with only in the most superficial and perfunctory manner. Although we confess to a feeling after reading this *omnium gatherum* of Mr. Williams' contributions to the literature of iron and steel making that the author might have done better, we must, in justice, say that much that is treated of is deeply interesting, and written in clear, vigorous, if occasionally dogmatic, language.

The introductory chapter gives an interesting account of various steps that led from the use of stone implements to those probably of native metals like gold and copper. We have seen specimens of native copper in a state of remarkable purity obtained from a remote province in the almost unexplored interior of Brazil. Attention was drawn to the metal by travellers who came across vessels and implements of beaten copper made by the untutored aboriginal natives, and enquiry revealed the existence of numerous "pockets" containing large masses and smaller nodules of metal. This would seem to uphold Mr. Williams's theory that the wide gap between the flint and bronze period was bridged over by a "gold,"—and we may surely add, a "native copper,"—period. Tin and copper ore, found, as they are, side by side in Cornwall may by accidental admixture and fusion in the same fire have originated the valuable alloy, bronze. The bronze period was a long one, owing probably to the great difficulty of obtaining iron from its ores. The early iron-makers naturally selected for their purpose the most metallic looking ore, as well as the one most easily reduced. This they found in magnetic oxide of iron, which could be reduced with charcoal in small furnaces, and which would yield a metal of the character of mild steel. In fact, the earlier samples of ancient iron were probably in most cases of the nature of steel, it being more easy to produce this from the available ores and fuel, than malleable iron.

This use of pure ores and pure fuel enabled the primitive iron-maker to obtain a satisfactory product in a rough and ready manner. The growing scarcity of charcoal fuel and the comparative scarceness of the purer ores of iron led ultimately to attempts to obtain iron by the use of more abundant ores and pit coal. Then the troubles of the iron-maker began. Sulphur was added to the resulting iron, chiefly from the fuel, and phosphorus from the impure ores, and with these two deadly enemies of iron, iron-masters and chemists are still struggling.

The growth of the iron industry is strikingly shown in the fact that in 1788 we produced 61,300 tons, in 1888 7,898,634 tons. There was a slight falling-off in our production for a few years subsequent to 1872, and Mr. Williams suggests one very reasonable explanation—viz., that iron, subject as it is to wear and tear and oxidation, is far from imperishable. Assuming, for example, that the average life of a rail is fifteen years, the millions of tons that were made from 1865 to 1872 must be thrown back as old iron between 1880-7. Ship-plates, boiler-plates, shafts, girders, &c., come back in like manner as old scrap, and, the greater our production at the time of their birth, the greater their competition with new iron after death.

The chapter on the ores of iron is clearly written and very interesting. The red ores, or hæmatites, consisting mainly of sesquioxide of iron (Fe_2 O_3), are favourites, owing to their freedom from phosphates. This freedom is due to their geological position. The phosphates, which are so damaging to clay iron-stones, are mostly, if not entirely, due to the remains of vertebrated animals, whose bones contain so much phosphate of lime. The nucleus of many of the clay iron-stone nodules is a fossilised fish. The best hæmatite occurs chiefly in the Cambrian and Silurian rocks, in which are only the remains of invertebrate animals, whose solid framework is carbonate of lime. Mr. Williams sees great possible changes in the future, and while he acknowledges for this country great advantages in the production of finished iron, he ventures the prophecy "that some of us may even live to see the time when pig-iron will be shipped from America to this country as ballast, as wheat is being shipped at present."

In the chapter on fluxing, roasting, and calcination, a good deal of space is devoted to the action of the various fluxes used in soldering. Mr. Williams apparently claims as his own theory in explanation of the action of these substances, one which almost every intelligent man has adopted—viz., that a flux acts not by altering the melting-point of the solder, or even by any direct effect on its fluidity when melted, but its whole efficiency depends on its presenting to the melted solder a pure metallic surface to which it can adhere, or, in fact, alloy itself more or less completely.

A suggestion is made that the so-called slag, or, as Mr. Williams prefers to call it, "cinder,', the most unmanageable of all the waste products of British manufactures, might be more used by architects for decorative work where fairly durable imitations of onyx, jasper, and agate would be suitable.

The chemistry of the blast furnace is dealt with in a very readable manner, but want of space prevents a full treatment of so large a subject, and our remarks must be confined to matters that may be regarded as of more immediate interest to our readers.

In connexion with remarks on the temperature of formation of carbonic acid gas and carbonic oxide, Mr. Williams refers to a fact too often ignored by stove-makers and users,—viz., "No carbonic oxide is traceable in cases of slow combustion, such as that of manure heaps, or in the animal body, neither does it show in slowly-burning stoves; but if we make a common unlined shop stove red-hot, there is a noxious escape of carbonic oxide which passes through the red-hot iron, and diffuses before there is time for its combustion in the air to take place. The headache effect of such ill-constructed stoves is due to this,—not to the drying or roasting of the air, as is commonly supposed. Carbonic oxide is an active irritant poison. Carbonic acid is merely non-respirable."

Pig-iron is very happily described as "a mongrel steel, containing too much carbon to be weldable, and too much of the other impurities to be malleable, or have any degree of workable toughness. Its simple merit is fusibility, and hence it may be used for foundry purposes, provided it is not excessively charged with silicon, sulphur, or phosphorus." It seems to be much more difficult to find a definition for steel that will apply to all its varieties. The fallacy of estimating the value of steel by its hardness is pointed out. Hardness is but one quality required; there must also be a special ability to endure smart blows or vibratory shocks. Where tenacity has to be combined with stability, and hardness with toughness, says Mr. Williams, "the best material at present known is made by combining the purest of iron with the purest of carbon, and excluding everything else." This, of course, does not cover those pseudo-steels obtained by the addition of other elements than carbon; these, however, are special productions useful in certain directions, but which may very well be excluded from the class of true steels. The addition of 2·45 per cent. of aluminium, according to a paper read by Mr. W. J. Keep before the Iron and Steel Institute last May, converts re-melted wrought-iron into a steel-like product that welds well and can be cast. Again, armour plates containing rather less than 4 per cent. of nickel have, according to American trials, exhibited great tensile strength, where an all-steel plate was completely cracked by the shot, and the Cammell compound plate may be said to have entirely broken up. It is at once a virtue and a vice in iron that its properties can be so marvellously modified by the addition of often infinitesimal proportions of other elements.

The chapter on the hardening and tempering of steel will well repay perusal. Some of the ancient recipes for fluids to be used in hardening steel are amusing. Good results may be looked for if the fluid used be "the blood of a man xxx years of age and of a sanguine complexion, being of a merrie nature and pleasant." Apart from these historical curiosities, the user of tools will obtain from Mr. Williams's lucid explanations much serviceable information.

Dealing with the all-important question of iron and steel tests, Mr. Williams very rightly insists on the fallacy of relying on mere hardness, or even the power of resisting a gradually and steadily applied tensile strain. We are glad to see a well-merited tribute of praise paid to an excellent little manual, which has long had a place on our shelves,—we refer to the "Management of Steel," by George Ede,—a work that puts to shame many more modern so-called technical manuals, which are often mere specimens of bookmaking by those quite devoid of practical knowledge of the subjects dealt with.

The chapter on "Iron *versus* Steel for Structural Purposes" opens with General Hutchinson's *couleur de rose* report on the ill-fated Tay Bridge which a few months afterwards became a ruin. The chapter is too lengthy and too important to be usefully summarised in a few lines, but it is insisted that for girders and the other supports of bridges which are especially liable to vibratory shocks, mere tenacity under a gradually-applied and steady strain is of little value unless taken in conjunction with other tests in which violent vibrations and sudden shocks are elements. "The theory that localised crystalline structure is produced by vibratory action may sometimes be very convenient for contractors, but," says Mr. Williams, "I doubt whether it has any reliable foundation in fact."

The chapter on the protection of iron from corrosion is a fair *résumé* of the subject. The chief point of novelty is the recommendation of "once run" mineral oil for the removal of rust and the subsequent preservation of choice ornamental ironwork. The device is only applicable, however, to interior ironwork and its efficacy is attributed to the formation of an imperceptible film of the semi-dissolved carbon in the crude oil. As we have already said, the Bower-Barff process is dealt with in a few bald sentences. Considering the widespread interest felt by all interested in iron as a structural material and the great expectations that were not long since expressed as to the future of the process, it would certainly seem that in a work devoted to the chemistry of iron and steel making space might well have been spared for a subject of so much moment, and about which there is so much difference of opinion.

The protection and ornamentation of iron by films of platinum, gold, and silver, obtained by the application of mixtures of essential oils and salts of the metals to the surface of the heated iron, we would suggest might also be described and criticised in any future edition that may be called for.

In conclusion, the book will be found, notwithstanding a few deficiencies, very useful to every intelligent user of iron, and we trust that its success will be such that its author will have an opportunity of imparting to it greater homogeneity, and of treating with greater fulness of detail many of the latest discoveries and applications connected with his subject.

Outlines of Ancient Egyptian History. By Auguste Mariette Bey. Translated and edited, with notes, by M. Brodrick. London: Gilbert & Rivington. 1890.

This compact and handy little volume of 175 pages is a model of what such books should be. The translator's work has been done carefully, and its supervision (as we are told in the preface), "both in manuscript and proof," by Mr. Le Page Renouf, Keeper of the Egyptian and Assyrian Antiquities in the British Museum, is sufficient guarantee of its accuracy.

The book is divided into two parts. Part I. treats briefly of the history of the "dynasties," in which their bewildering chronology and probable historical sequence are intelligibly set forth. Part II., to most people perhaps the more interesting half of the book, is devoted to an account of the principal monuments, arranged in order of time, according to the dynasty under which they are supposed or known to have been erected or wrought. The excellence of this arrangement is obvious.

We notice one grave defect,—viz., the absence of any kind of index. Surely, in a work of this sort we ought to have had, at least, an index of names of persons and places. Let us hope that the book may speedily reach another edition, so that so serious an omission may be supplied.

An Account of the High Altar-Screen in the Cathedral Church of St. Albans. By Henry Hucks Gibbs. St. Albans: Gibbs and Bamforth; 1890.

This is a pamphlet giving a short account of the history, as far as known, of this celebrated screen, of the modern statues, which have been inserted in it, and of its restoration generally, by Mr. Henry Hucks Gibbs, at whose sole expense the screen has been restored. Illustrations are given of the screen as now restored, and of its appearance in the epochs of its previous history. The names of the saints whose figures are inserted are given, with a short account of each. The figures and the new work generally were executed by Mr. Harry Hems. The proceeds of the sale of the book are to go to the Repair Fund of the Abbey.

Correspondence.

To the Editor of The Builder.

ADJOINING OWNERS UNDER METROPOLITAN BUILDING ACT.

Sir,—Referring to the article under this heading, in your issue of the 31st ult., and Mr. H. Chatfeild Clarke's letter in your number of the 7th inst., it would appear that the decisions in the two principal cases cited by you, viz., Hunt *v.* Harris (1865), 34 L.J., C.P., 249, and Fillingham *v.* Wood, L.T.R., year 1890, p. 66; Surveyors' Institution Professional Notes, vol. iv., p. 381, are directly in conflict.

In Hunt *v.* Harris, the plaintiff and defendant were respectively leaseholders for long terms, of adjoining premises, No. 38 and 37, Eastcheap. The party-wall between the premises got out of repair and became dangerous. The Commissioners of Sewers for the City of London, in accordance with sec. 72, served both plaintiff and defendant with notice to repair the wall. Plaintiff, the leaseholder of No. 38, accordingly did the necessary work; defendant, the leaseholder of No. 37, did nothing, and refused to pay to plaintiff any contribution towards the expense, on the ground that he (defendant) was not "owner" within the meaning of the Act, so as to make him liable therefor, as he alleged that he had underleased in parts, to several underlessees, the whole of his premises, No. 37, for terms of seven and a half and twenty-one years, and that therefore they, his underlessees, were the persons liable for payment. On appeal to the Court of Common Pleas, judgment was given for plaintiff, the Court affirming that the defendant was, under the circumstances, the person meant by the Act to be made liable for payment, and not his undersees.

The recent case of Fillingham *v.* Wood, decided by Mr. Justice Chitty, was that of a party-wall, in which the "building owner" on one side gave the usual previous three months' statutory notice to Smith, the leaseholder of the whole of the adjoining premises, and proceeded to do works to the party-wall. It appears that Smith himself occupied a portion of his premises, but had underleased other portions next the party-wall to the plaintiff for a term of three years. Plaintiff now asked for an interim injunction to prevent defendant interfering with the party-wall, on the ground that he (plaintiff) was entitled, as "owner," under the interpretation section of the Act, to three months' notice from defendant, before defendant could be entitled under the Act to interfere with the party-wall. Mr. Justice Chitty held that plaintiff, although only an underlessee for a short term of a portion of the premises only, was an "owner" within the meaning of the Act, and so entitled to notice, and granted the injunction.

In Hunt *v.* Harris the Judges, Earle, C.J.; Byles, J.; and Smith, J., appear to have arrived, by three different roads, to the conclusion that under-lessees of portions of the premises were not "owners." Earle, C.J., said the "owner" meant by the Act is the owner of the structure, viz., a person in possession or receipt of the rents and profits, *i.e.*, a person having a beneficial lease entitled to the rack rent and that the statute contemplated in the "adjoining owner" something in the nature of a permanent interest of the whole of the premises, as appears from section 84 [giving power to adjoining owner to have chimney-stacks, &c., built]. He points out also that by section 74 if "owner" will not pay, the Commissioners have power to sell the structure, and

it would be very inconvenient to think of selling in case of default of a sub-lessee who might have a very short term only.* He says the owner of a long term who has underlet and who is entitled to the rack rents is liable. He may or may not have recourse to his underlessees or to his landlord for contribution, that depends on their contracts. Byles, J., said there is nothing to show that the demises of portions of these premises to the underlessees carries any interest whatever in the party-wall. Lodgings are frequently let on leases for terms of more than a year, and he certainly would be very much astonished to be told that such leases include the demise of portions of the party-wall. (It is well known, however, that some leases of portions of premises do demise portions of the external and party-walls, although it is possible that they do not do so by presumption or inference, but only by express mention thereof. A. & C. H.). He certainly did not find that defendant demised any portion of the party-wall to his sub-lessees, and therefore he, the defendant, was liable. Smith, J. It is difficult to construe the Act definitely. The facts of each case must be narrowly looked at. He thought, in this case, defendant answered the description of "owner" in the Act. Defendant is in immediate possession of the whole of the rents and profits, and therefore the beneficial "owner," and the evidence did not satisfy the court that there are other persons who would answer that description.

In Fillingham *v.* Wood, Mr. Justice Chitty echoes Mr. Justice Smith as to the difficulties of putting a definite construction on this Act of Parliament and the expediency of dealing with each case as it arises, and then proceeds to give judgment for plaintiff on the ground that although he is only underlessee for only a portion of the premises, yet he is an "owner" according to section 3, because his term was greater than that of a "tenant from year to year."

The Judges appear to have coincided with the observation said to have fallen from the late Lord Chief Justice Cockburn, that "the builders made the Act, and they had better interpret it, for he could not."

The following sections of the Act more particularly refer to the "owners" and their liabilities, viz., section 3 (interpretation) "'*Owner*' shall apply to every person in possession or receipt either of the whole or of any part of the rents or profits of any land or tenement, or in the occupation of such land or tenement other than as a tenant from year to year, or for any less term, or as a tenant at will." Section 97 of Part 4 (Miscellaneous Provisions): "The owner immediately entitled in possession to such premises, shall in the first instance pay such expenses. . . . . If there be more owners than one, every owner shall be liable to contribute to such expenses in proportion to his interest,"—*i.e.*, to pay contribution to the owner who has, in the first instance, paid all the expenses. But it has been held that this does not entitle a lessee to levy contribution from his landlord if he, the lessee, is under express covenant to repair the party-walls.

These, to the lay mind, apparently conflicting decisions do not appear to assist us to the definition of the meaning of "owner" in the Act, more especially as the judges in both cases warn us that we must only very narrowly apply their decisions to other cases. But it should be borne in mind that Hunt *v.* Harris is probably of superior authority, being that of the Court of Common Pleas, presided over by the Lord Chief Justice thereof, whilst Fillingham *v.* Wood is a decision by a single justice of the Chancery Division, and on a prayer for an interim injunction only.

If Hunt *v.* Harris be correct, then, as sub-lessees for more than a year are not "owners" liable to pay, one would reasonably consider that they are not owners entitled to notice; but then Mr. Justice Chitty, in Fillingham *v.* Wood, says they *are* "owners" entitled to notice (their liability to pay not arising in that case).

The general practice with architects has been, as Mr. Chatfeild Clarke correctly states, to serve notices on the under-lessees of parts of adjoining premises, and to receive contribution from them, but if the superior lessee of the whole premises is also entitled to notice, how are to be arranged the differences which may arise? The Act provides for a quasi-arbitration by three surveyors only,—one appointed by the building owner, one by the adjoining owner, and a third surveyor, who is to be appointed by the other two surveyors, and is to act in the event of their disagreement. But, having served a notice on the lessee of the whole premises and on each of the underlessees of each portion, how are we to act if the lessee and his underlessees differ and each appoints his own surveyor? There will be then four surveyors to each portion of the party-wall, an impracticable and illegal number, which, we think, shows that the Act did not contemplate more than one immediate "owner" of any portion of a party-wall, to be dealt with by the building owner.

The only clear line of interpretation we can get from the cases is that the adjoining "owner" must be either the owner in fee, not encumbered with any tenant in possession holding a greater interest than "from year to year, or as tenant at will," or he must be the lessee or underlessee immediately entitled to possession, and to whom the party-wall or a part therefore has been demised.

Personally, we consider this conclusion to be unsound and inconsistent with the general tenour of the Building Act, which ignores actual ownership in party-walls; but where it finds one wall only between two premises occupied by different persons, makes that wall a "party-wall," quite irrespective of whether it is built wholly on the land belonging to the one premises or the other, or partly on the land of one and partly on the land of the other, and gives to the owners of both premises certain rights over the wall, and subjects them both to certain liabilities in respect thereof without regarding whose property the wall might be otherwise.

A. & C. HARSTON.

* The learned Judge did not comment on the difference which existed between the powers of the *Commissioners* (of Sewers of the City of London) and those of building owners, in the recovery of expenses. The Commissioners' powers, as is proper in the case of a public authority, are more extensive than those of a "building owner." (And it must be remembered that this was an action by an owner and not by the Commissioners.) The former by sec. 74, may, in the event of non-payment by the owner, "sell such structure . . and deduct from the proceeds of such sale the . . expenses." The building owner has no such power. Further, sec. 73, "the expenses incurred by the Commissioners in respect of any dangerous structure . . shall be paid by the owner of such structure, but without prejudice to his right to recover the same from any lessee or other person liable to the expenses of repairs." From which it may be inferred that the Commissioners had a wider range of owners to proceed against than have "building owners," leaving the owners so proceeded against, recourse to their lessees or sub-lessees according to the tenour of their respective contracts.—A. & C. H.

PROPOSED NEW CONCERT HALL, LANGHAM-PLACE.

SIR,—In the description of the above building sent you by my friend Mr. Knightley, and published in your last issue, he has forgotten to mention that the designs were prepared in 1887 for a proposed Company by Mr. Knightley and myself as joint architects—Mr. Knightley taking the elevations and I the plans and internal arrangements and the negotiations with the late Metropolitan Board, who gave their sanction to the plans. The drawings, with the exception of the elevations, were all made in my office, the plan on street-level, which you publish, being a facsimile of one of them. The Company never went to allotment, though it is still in existence, and under a private arrangement as to fees between me and Mr. Knightley made in September last (as a personal client of his was going to erect the building), I was "to retire from all active interference in the building of the hall;" but none the less the building will be the joint design of Mr. Knightley and yours obediently,

CHARLES J. PHIPPS, F.S.A.

The Student's Column.

VENTILATION AND WARMING.—VII.

FORMULÆ FOR CALCULATIONS.

THE formulæ which are used for calculating the various problems that have to be solved in the determination of the proper size of openings and channels, and of the extent of the motive power to be supplied in order to plan a system of ventilation to fulfil a definite purpose, are based upon the laws which regulate the movement of fluids in general.

As the method of arriving at our specific formulæ is instructive, we will proceed to investigate the general case.

In Fig. 1 we have a channel A B′ communicating with a larger channel B C, and we will consider the movement of the fluid, with which these are filled, in the direction of the arrows.

We will assume that the temperature of the fluid in the two channels is different, that in B C being higher than that in A B′, so that the specific weight of fluid in A B′ is greater than that in B C, and that the different specific weights per unit of volume are r_1 and r_2. The sectional areas of the channels we will denote s_1 and s_2, their length h_1 and h_2 respectively. If the channels stand vertically, the volume of fluid in A B′ acts with its full weight $h_1 r_1 s_1$ by the force of gravity, to produce movement in the direction of B C. But if the channels are in a sloping situation, the force exercised in producing movement is less. We will therefore consider the channels to be horizontal, and assume a concentrated force R_1 to be acting at the point A, operating equally on the mass A B′. Therefore we assume that the force R_1 amounts to m times the weight of the mass $h_1 r_1 s_1$. Thus we have (1) . . . . $R_1 = m h_1 r_1 s_1$.

Similarly, for the motive force acting on B C, we have—

(2) . . . . $R' = m h_2 r_2 s_2$.

To maintain the motion there must be acting in accordance with hydrostatical laws on each unit of the section a force of $\frac{R'}{s_2} = m h_2 r_2$. Accordingly, on the section s_1 of A B′ must be acting a force at B′ or A of $R_2 = \frac{R'}{s_2} s_1 = m h_2 r_2 s_1$

We have, therefore, acting at A, an united force of

(3) . . . . $R_1 + R_2 = m h_1 r_1 s_1 + m h_2 r_2 s_1 = m (h_1 r_1 + h_2 r_2) s_1$

And, accordingly, for the value of m we have

(4) . . . . $m = \frac{R_1 + R_2}{s_1 (h_1 r_1 + h_2 r_2)}$

where $R_1 + R_2$ denotes the motive force operating on the moving weight.

If we consider in the whole mass from A to C a moving stream whose section is unity, and take Q to be the weight of fluid set in motion in an unit of section, and of the weight producing motion in the same unit, we have $r_1 h_1 + r_2 h_2 =$ Q and $\frac{R_1 + R_2}{s_1} = q$, that is $R_1 + R_2 = q s_1$, and substituting these in (4) we have

(5) . . . $m = \frac{q s_1}{s_1 Q} = \frac{q}{Q} = \frac{\text{moving weight per sq. unit.}}{\text{moved weight per sq. unit.}}$

The determination of the factor m is, therefore, independent of the positive sections of the various channels, but is rather a function of the length of the channels and the specific weight of the fluid.

To investigate the question of velocity with an accelerating force g^1 per second, and an initial velocity of c per second, we have for the—

Velocity at end of 1st second $c + g^1$
" " 2nd " $c + 2g^1$
" " t " $v = c + tg^1$

Therefore (6) $g^1 t = v - c$, $\frac{g^1 t}{2} = \frac{v - c}{2}$ and

$$(7) \quad t = \frac{v - c}{g^1}$$

The mean velocity is $c + \frac{g^1 t}{2}$ therefore the length $H = \left(c + \frac{g^1 t}{2}\right) t$.

By substitution from (6)

$$H = \left(c + \frac{v - c}{2}\right)\left(\frac{v - c}{g^1}\right) = \left(\frac{2c + v}{2}\right)\left(\frac{v - c}{g^1}\right)$$

and $2 g H = (c + v)(v - c) = v^2 - c^2$,
therefore $v^2 = c^2 + 2 g^1 H$.

If we take $g^1 = m g$, that is m times the accelerating force acting per unit of length, then from (5)

$g^1 = g \frac{q}{Q}$ and hence follows

$$(8) \quad v^2 = c^2 + 2 g \frac{q}{Q} H.$$

If we now consider A B in figure 2 as a part of a channel with an uniform section s then the flow therein will, in accordance with experience, have an uniform velocity v if moving freely without hindrance. If r denotes the weight of a cubic unit, we have for the acting force $H s r v^2$.

If we consider the flow to be going on at very small intervals of time, and that in this manner a part equal to $\frac{1}{n} H \times s r$ arrives at the outlet B, the remaining acting force becomes

$$(9) \quad H s r v^2 - \frac{1}{n} H s r v^2 = H s r \left(v^2 - \frac{1}{n} v^2\right).$$

This part $\frac{1}{n} H s r$ is restored by a similar amount of inflow at A. In the first moment, the velocity which the remaining volume retains is reduced to v_1, because the moving force must be distributed also over the newly-imported portion of the flow. The acting force of the present whole mass in the length A B will therefore be: $H s r v_1^2$ but if we assume n so large, and the part $\frac{1}{n} H$ so small, that the outflow becomes continuous, then no loss of the acting force results, and the equation (9) holds good.

Hence $H s r \left(v^2 - \frac{1}{n} v^2\right) = H s r v_1^2$ from which

$$(10) \quad v^2 = v_1^2 - \frac{1}{n} v^2 = v^2 \left(1 - \frac{1}{n}\right).$$

The velocity of movement in any part of the channel $\frac{1}{n} H$ can be calculated from (8).

As the final velocity must, in accordance

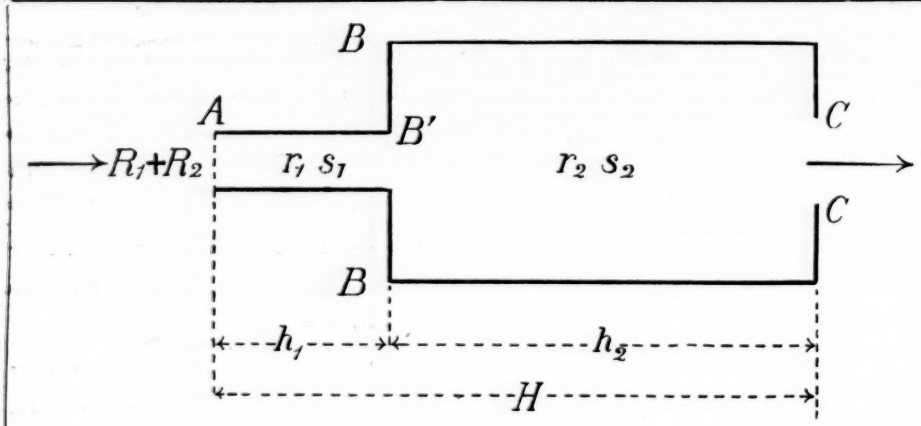


Fig. 1.

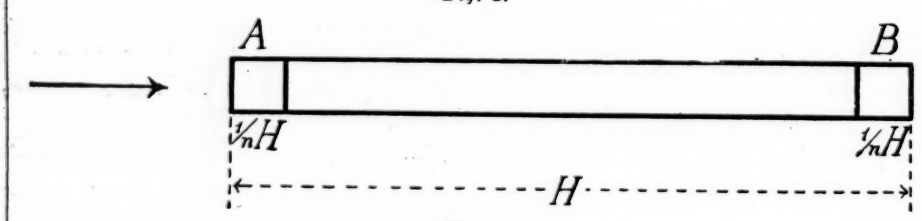


Fig. 2.

with the above investigation, attain the original velocity v, we have $v^2 = v_1^2 + 2g\frac{q}{Q}\frac{1}{n}H$, and by substitution from (10) there follows—

(11)... $v^2 = v^2 - \frac{1}{n}v^2 + 2g\frac{q}{Q}\frac{1}{n}H$, from which results—

(12)... $v = \sqrt{2g\frac{q}{Q}H}$.

By taking the interval of flow at a length $\frac{H}{n}$ we should have a velocity according to (10) & (11) from the beginning of one interval to its end increasing from $v_1 = v\sqrt{1-\frac{1}{n}}$ to v, and at the transition to the next interval returning immediately from v to $v\sqrt{1-\frac{1}{n}}$.

If $n = \infty$, $\frac{H}{n} = 0$, that is if the intervals are infinitely small, the limiting velocities are v and $v_1 = v\sqrt{1-\frac{1}{\infty}} = v$. The movement is then continuous, and the constant velocity is equal to v, that is, equal to $\sqrt{2g\frac{q}{Q}H}$.

We can now proceed to apply this to the case of motion produced in fluids by reason of a difference of temperature.

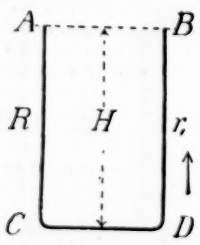


Fig. 3.

In fig. 3 let us assume A C and B D to be columns of water of equal sectional area and equal height, connected by the continuation of the same pipe C D, but of different temperatures, that of B D being the higher. Then the weight of the column A C is greater than that of B D, and as the atmospheric pressure at A and B is the same, movement results in the direction of the lesser resistance, that is, towards B.

The force tending to produce motion is, taking the sectional area of the columns as $=1$, $H R - H r = H(R-r)$, where H is the height of the column and R and r the respective specific weights. If we now suppose the column B D separated, the motive force is acting at D, and the weight moved is $H r$. The length $= H$. Our general formula (12) gives us, therefore, for the velocity

(13) $v = \sqrt{2g\frac{H(R-r)}{Hr}H} = \sqrt{2gH\frac{R-r}{r}}$

and the amount of outflow per second is, when s = the smallest section of the whole arrangement

(14) $vs = s\sqrt{2gH\frac{R-r}{r}}$

Similarly it is evident that if the column BD were of varying temperatures, and therefore of varying specific weights, r_1, r_2, r_3, &c., then, if r is the mean specific weight, our formula (13) holds good. Again, if the column A C be similarly considered, and R be its mean specific weight, the formula also holds; and we may therefore consider it generally true where R and r are the mean specific weights of the respective columns.

We have, for convenience, assumed the fluid to be water, but as we now see that the movement wholly depends upon difference of specific weight in the columns, our results will hold good for any fluid, and therefore for air.

OBITUARY.

THE LATE BARON VON HANSEN.—We regret to have to record the death of this eminent architect, who was one of the most prominent representatives in Europe of the old school of Classic architects. He was seventy-eight years of age at the time of his death. Von Hansen was created a Baron by the Austrian Emperor, in recognition of the services he had performed in the beautifying of the capital, which owed to him some of its finest special buildings, and also to a great extent the public improvement carried out in the formation of the Ringstrasse. Baron von Hansen was an Honorary Corresponding member of the Royal Institute of British Architects, from whom he received also in 1888 the Royal Gold Medal, when the President, Mr. Waterhouse, spoke in high terms of admiration of his works.

A good many of Hansen's buildings have been illustrated from time to time in our columns; we may refer to the Houses of Parliament, Vienna (December 29, 1877); the great hall of the Vienna Exchange (November 23, 1878); the Academy of Plastic Arts, Vienna (April 1, 1876); and the Academy of Science at Athens (January 5, 1884). The Houses of Parliament at Vienna is one of the finest modern works in Greek style; formal no doubt from the point of view of those who look to picturesqueness as the main element in architecture, but exceedingly dignified in effect and grouping; and as to style, Vienna is nearer to Greece than England, and a style which is certainly unsuitable here may be better accepted there, in point of suitability to climatic conditions, &c. The qualities of dignity and breadth of treatment which are so prominent in the Houses of Parliament are equally to be seen in the Academy of the Plastic Arts, with its lofty plain basement (occupying about half the height of the building) and the elegant effect of the small columnar orders in the upper stories, contrasting with the expanse of plain wall at the base. The particular form of architecture which Hansen followed has perhaps had its day, as a style for modern use; but the high artistic merit of its treatment at his hands must always be recognised.

RECENT LEGISLATION AS TO BUILDINGS AND STREETS IN LONDON.—A paper on this subject was read by Mr. A. A. Hudson, Associate, at the meeting of the Surveyors' Institution held on Monday evening last.

GENERAL BUILDING NEWS.

RESTORATION OF CANTERBURY CATHEDRAL.—The work of restoration to be carried out at Canterbury Cathedral comprises a new roof over the cloisters, and a concrete bottom to the floor of the triforium. The front of the cathedral, near the north Norman tower, is being restored, and when this is completed steps will be taken to arrest the decay of the south front, restored in Dean Alford's time, which is mouldering away from the softness of the Caen stone then used. The works, which will be spread over several years, are being designed and carried out in accordance with the advice of Mr. Ewan Christian.

RESTORATION OF SELBY ABBEY.—A part of the work in connexion with the restoration of Selby Abbey has just been completed. Some time since the Restoration Committee received an offer from Mr. Thomas Holdsworth, of Clay Cross, Derbyshire, a former resident of Selby, to undertake the cost of the restoration of the sacristy. This offer having been accepted, a plan was drawn up by the architect, Mr. J. Oldrid Scott. This included the laying of a marble pavement in two colours, red and white, in alternate squares; the restoration of the carved stonework, the greater portion of which had been removed to other parts of the church; and the cleaning and repairing of the oak screen and altar-rails.

DUNBLANE CATHEDRAL RESTORATION.—The nave of this building, which has stood without a roof for 300 years, has now got a new roof put on. The large Gothic windows have also all been glazed, including the great west window in the western gable. The choir, which has served for centuries as the Established Church, has had its roof stripped off, and a new one is to be put on to harmonise with the new roof of the nave.—*Scotsman.*

NEW CONGREGATIONAL CHURCH, COVENTRY.—The new church in Warwick-row, Coventry, has just been completed. The frontage is a modification of the Italian style of architecture. In the centre is the main entrance, surmounted by a semicircular stone arch. On each side is a separate front entrance to the galleries. There are six windows in front, which, like the main entrance and gallery doors, have semicircular arches. Above the entrance is a balcony. The main doorway gives access to a porch, from which folding doors on either side open into small lobbies, and these again by other folding doors into the chapel. The chapel is 73 ft. long and 45 ft. wide, with an apsidal recess at the end opposite the entrance, cut off by a light stone screen, supported by two marble pillars. The pulpit is supported by a short stone pedestal, and is constructed of mahogany, with ebonised mouldings and pitch pine panels into which perforated gilt ironwork is fitted. The whole of the seats are of pitch pine. The galleries are supported by iron pillars. The windows have lead lights, with cathedral tinted glass. Around the walls there is a wainscoting of pitch pine. The ceiling has a curved surface, relieved by an ornamental border. Tobin's ventilators are used, and the building is heated throughout with hot water, the boiler for which is in the basement in the rear of the chapel. Communicating with it are the minister's and deacon's vestries, &c. Beyond these vestries the schools are situated. The main room is 50 ft. long by 28 ft. At the extreme rear of the building is the infants' school, fitted with gallery seats. Over the vestries is a lecture-hall. The schools and all the other parts of the premises communicate by passages with the chapel. Messrs. G. & I. Steane, of Coventry, were the architects. Mr. C. G. Hill, of Coventry, was the contractor. The heating apparatus was commenced by the Eagle Iron Works Company, and finished by Messrs. Matterson, Huxley, & Watson.

TOWER OF ASHBOURNE CHURCH. — We hear that the tower and spire of Ashbourne Church, Derbyshire, are about to be restored. The spire is over 200 ft. high. The work has been entrusted to Mr. Alfred Hill, of Tideswell.

DEDICATION OF ST. AUGUSTINE'S CHURCH, ADDLESTONE.—The Church of St. Augustine, Addlestone, Surrey, has just been dedicated by the Bishop of Guildford. It has been erected on a piece of land which was given by the Ecclesiastical Commissioners, and which adjoins the Weybridge-road. It is a corrugated iron building, consisting of nave and chancel, with a vestry at the south of the eastern extremity of the nave. Internally the woodwork which lines the walls is painted grey. The chancel has a raised floor. It is separated from the nave by a carved and gabled screen. There is a carved panelled reredos, and the pulpit and lectern are of stained and polished pine, as is also the screen. The building is heated by stoves. The total cost of the whole work was 500*l*. The church was erected by Messrs. Jones & Willis, of London, but a local paper states that much of the designing for the interior was the work of, or was suggested by, the vicar.

RE-OPENING OF LOXLEY CHAPEL, NEAR SHEFFIELD.—This chapel has just been restored and renovated. The gallery has been strengthened by new ornamental metal columns, and re-pewed with seats. The body of the chapel also has been re-pewed with seats of pitch pine. A new gallery has been erected at the east end for the new organ.

The old pulpit, which has been restored, is brought forward in front of this gallery, and is surrounded by communion-rails. Two new vestries and two class-rooms have also been provided. The door on the south side has been replaced by a window. At the west end two new porches have been erected of pitch pine. New staircases giving access to the gallery at both the east and west ends of the building have been put up. The heating apparatus, which was supplied by Messrs. Newton, Chambers, & Co., has been fixed to warm both the chapel and the schoolroom. The contractors are Mr. James Fox, of Bradfield, and Mr. Jonathan Marsh, of Stannington. Mr. G. A. Wild was the architect. The estimated cost is 1,200*l.*

COMPLETION OF ST. JOHN'S CHURCH, BURNLEY.—The church of St. John the Baptist, Burnley, is now undergoing alteration and enlargement. The nave is to be extended by two bays, giving an additional accommodation for about 100 people. A tower is also to be erected, the height being 105 ft. The ground floor of the tower will be used as a choir vestry, and there will be a porch at the south entrance to the church. The architects are Messrs. Waddington & Son, of Burnley. The estimated cost of the alteration is about 4,000*l.*

REBUILDING OF DUNCOMBE HOUSE, HELMSLEY.—On the 17th inst. the Earl of Feversham laid the foundation-stone of a new mansion at Helmsley, Yorkshire, which is to replace the one destroyed by fire twelve years ago. The new residence will occupy the same ground as that on which its predecessor stood, and the original style of architecture, English Renaissance Classic, will be reproduced. The plans have been prepared from designs by Mr. William Young, of London, and the contract for the execution of the work has been entrusted to Messrs. W. & J. Kirkwood, of Edinburgh. The floor above the basement will be mainly occupied by the grand hall and a saloon. The hall, which will be entered from the west side, is to be 40 ft. square and about 38 ft. in height, and will be finished with stone dressings, fluted columns with Corinthian capitals. The saloon will be entered from the hall, and this apartment will be 90 ft. by 25 ft. A dining-room will occupy the north-east corner of the block, and on the basement there will also be a suite of apartments. The floor above will be approached from the hall by two staircases, the one of oak and the other of stone. On this floor the plans provide for the construction of a dozen bedrooms, and there will be a chapel 35 ft. by 24 ft. at the north-west corner. On the attic floor there will be fifteen more bedrooms and other appointments. The servants' quarters are in the wings, which were uninjured by the fire, but provision is to be made in the new building for the housekeeper and butler. The floors are to be of fireproof construction, and the building will be heated by hot-water pipes, Haydn's system being that adopted, and hydrants will be placed on every floor. The mansion will be built of freestone from the Bilsdale and Farndale quarries. The estimated cost is a little over 30,000*l.*

BARROW CHEMICAL WORKS.—The estimate of Messrs. W. A. Peters & Sons, Townhead, Rochdale, amounting to 7,700*l.*, has been accepted for the construction of the new Machine-house and Salle, for the Barrow Chemical and Wood Pulp Works, Barrow-in-Furness. The architects are Messrs. Maxwell & Tuke, of Manchester.

FOREIGN AND COLONIAL.

FRANCE.—It is proposed that the profits arising from the exhibition of Meissonier's works, to be organised by the École des Beaux-Arts, should be devoted to the erection of a statue to his memory in one of the public places of Paris. The Municipal Council of Lyons intends also to place a tablet to mark the house in which he was born. The house is situated in the Rue de Thou, near the Place Croix-Pâquet.——The French Government has conferred the title of Chevalier of the Legion of Honour on the German painter Charles de Uhde, whose picture of Christ inviting children to come to Him, treated in an entirely modern spirit, attracted much admiration at the Champ de Mars Salon.——The death is announced, at Cosne, of the painter Dumont.——The Art Club of Rotterdam, which has for some years held in that city exhibitions of the works of French artists, proposes to get up in Paris an exhibition of the works of Dutch artists. Probably the Ville de Paris Pavilion will be put at their disposal for this purpose.——The "Société Philanthropique" of Paris will open in the month of May an exhibition illustrating the art of the early part of the nineteenth century, in a gallery in the Palace des Beaux-Arts; including not only pictures and statues, but also furniture and costumes of the period.——The large foot-bridge which, during the 1889 Exhibition, served to connect the galleries of the Quai d'Orsay, opposite the Pont d'Alma, has been purchased for 35,000 francs by the Compagnie du Nord and the town of Calais, and it now unites the two parts of the new railway-station at Calais. It has been tested up to a load of 114,000 kilogrammes without deflection, though it was licensed for 46,000 kilogrammes only.——The new theatre at Mayenne, of which M. Hélain is the architect, has just been opened.——The new Hôtel des Étudiants at Montpellier, designed by M. Carlier, has just been opened. The great hall is decorated with large mural paintings by MM. Ernest Michel, Marsal, Leenhardt, and Privat. Another artist, M. Cayla, of Montpellier, has decorated the Salle des Jeux with some fine landscapes.——M. Grébaut, director of the French Archæological School at Cairo, has discovered at Thebes no fewer than 240 sarcophagi of the priests of Ammon, some large statues of Osiris, Isis, and Nephtis, 100 papyri and a great number of statuettes. This discovery was made near the place where M. Maspéro discovered, in 1881, the Royal mummies of several dynasties.——Three more antique busts have been discovered in the course of the excavations at Martres-Tolosane.——M. Colibert, the architect who made the restoration of the Rue St. Antoine and the Bastille for the 1889 Exhibition, has left for America, with the object of designing for the Chicago Exhibition some restorations of portions of American cities as they appeared in the 15th 16th 17th and 18th centuries.——The death is announced, at Versailles, of a very talented engineer, M. Adolphe Wenger, who was formerly attached to the Paris, Lyons, and Mediterranean Railway Company. He was the inventor of the form of continuous brake adopted by the Orleans Railway Company, and on some of the Russian railways.——It is considered tolerably certain that the vacancy in the Institute, left by the death of Baron Haussmann, will be filled by M. Alphand.——The Committee of the "Association Amicale des Architectes Diplômés par le Gouvernement" has elected the following officers for the year 1891:—President, M. Marcel Deslignières; Vice-President, M. Paul Wallon; Assistant-Secretary, M. Léon Destors; Treasurer, M. Davoust; Members of Council, MM. Yosso, Gautier, Leclerc, Mayeux, Michelin, Chancel, Dupuis, Gagey, Bonnier, G. Hénard, Poupinel, and Redon.——The three ceilings commissioned from M. Henri Levy, for the Mairie of the Sixth Arrondissement, have just been fixed in position. They are circular paintings, forming allegorical representations of the three-fold Republican motto: Liberty, Equality, Fraternity.

BERLIN.—The Committee of the International Art Exhibition has published an official notice to the effect that it has been decided to give the Architectural Division a prominent position by itself, and we hear that room will be found for the exhibits in the spacious and well-lighted "Machinery Hall" of the Exhibition buildings. The new Berlin Architectural Society, Vereinigung Berliner Architekten, is to have the management of the Architectural Division, and has been asked to elect a hanging committee under the presidency of Professor F. Wolff, of the Royal Technical College.——The Emperor, whilst dining with the French Ambassador, M. Herbette, last week, expressed the hope that France would be well represented at the May Exhibition, and that "Chauvinism" would be forgotten in matters concerning art. He set a good example with his letter of condolence to the Paris Academy on the occasion of the death of Meissonier. A letter from the French Ambassador to the Managing Committee of the Exhibition, which has now been published, shows that the matter has been recommended to the attention of the Paris artists, and that the Emperor's hope is likely to be realised, although the Paris Salon and Moscow Art Exhibition will be on at the same time.——At the older of the two architectural societies, Architekten Verein zu Berlin (in which faces have greatly changed since the formation of the rival institution) an election of officers has taken place. The places of the retiring President and Vice-President (Messrs. Wiebe and Schwechten) have been filled by Geh. O. Brths Voigtel and Jungnickel, and in the Committee we see the names of Messrs. Blankenstein, Eggert, Goering, Hagen, Hossfeld, Jacobsthal, Kellert, Sarragin, and Wallot. The new régime intends dividing the members into two distinct groups: (1) for architectural art and archæology; and (2) for construction and civil engineering.——The Prussian Royal Academy intends giving away a travelling studentship of the value of 150*l.* a year for two years, together with an extra sum of 30*l.* for travelling expenses proper. Competitors must be under 32 years of age. The conditions require candidates not only to give proofs of former study in the form of sets of drawings, but also require them to work out a design for a given subject in six months' time, and to work out a small sketch design before the examining body.—— In the "Kunstgewerbe Museum," where the model of Professor J. C. Raschdorff's new Cathedral design can be seen, models of buildings in the vicinity of this proposed erection have now been placed in position. The effect of the different buildings, such as the royal castle, the old museum, &c., in comparison to the proposed Cathedral is unsatisfactory, the Cathedral entirely "killing" its neighbours.——"Die Allgemeine Electricitäts - Gesellschaft," in whose hands the electric-lighting of a greater part of the city now lies, has to supply current for 120,000 incandescent and 6,000 arc lights this year. Subscribers pay a third of a penny per hour for an incandescent light, the fee charged for keeping a single light in order is 5s. per annum, and the rent for the "meter" 40s. per annum.

MISCELLANEOUS.

BUDAPEST.—By order of the Hungarian Ministry of Commerce, an Exhibition of Products, Machines, and Implements connected with the various clay, stone, cement, and asphalt industries, will be held, under the management of the directors of the Commercial Museum at Budapest, in the Exhibition Buildings, in the Stadtwaeldchen, from May 15 to June 30, 1891. Foreigners are invited to exhibit all kinds of labour-saving machines, implements, and appliances connected with the above industries, and also articles of the said industries, manufactured in foreign countries, provided they are not yet produced in Hungary. Further particulars may be obtained through the Austro-Hungarian Consulate, 11, Queen Victoria-street.

MR. BALDWIN LATHAM ON THE BENARES DRAINAGE.—Mr. Baldwin Latham, the sanitary expert, has completed his inquiries with reference to the Benares drainage schemes, and laid his views before the Municipal Commissioners on Monday last. With regard to the question disposing of the sewage in the Ganges, he said the objections to this course were purely sentimental—that danger to public health could only occur for a short distance below the outfall. He nevertheless strongly recommended the Board to bring themselves into accord with public feeling on the subject in England, and dispose of the sewage on land. If this course were adopted, he advised the Board to acquire 1,000 acres of land for a sewage farm, and retain the management in their own hands. In considering the cost of the disposal of the sewage on land, he said that, exclusive of expenses for cultivation, it would cost not more than Rs 23 to Rs 33 an acre; and the question the Board had to consider was what portion of the expenditure would be recovered by the profits of the farm. Judging from experience in England and India, it appeared to him most probable that the additional cost accruing from the disposal of the sewage on land would be recouped to them.—*Indian Engineer.*

ELECTRIC LIGHTING. — In connexion with this subject we have received from Mr. B. T. Batsford, a book by Mr. F. A. Fawkes, which contains sections and patterns for "architectural and enriched casings for electric wires," showing how the wiring can be laid in grooves in casings and skirtings, with screw-dome moulded covering pieces. We have also to acknowledge the receipt of Messrs. Blakey, Emmott, & Co.'s price-book of electric light machinery.

THE AMERICAN PRODUCTION OF PIG IRON.—The statistics published by the American Iron and Steel Association, and compiled from returns received direct from the manufacturers, show that, for the first time in the history of the iron industry of the United States, that country has at last succeeded in beating her great European rival, Great Britain, in the annual output of pig iron. We learn that the American production of crude iron last year was 9,202,703 gross tons (of 2,240 lb.). We in this country are somewhat less expeditious in getting early statistics of that nature, but it may be estimated that our output of pig iron in 1890 will be something under 8,000,000 tons so that the United States have outstripped Great Britain by close upon a million and a quarter tons. As the American production of pig-iron in 1889 was 7,603,642 tons, the increase in 1890 amounts to no less than 1,599,061 tons, or over 21 per cent. The output of 1889 being over 17 per cent. greater than in 1888 (when it was 6,489,738 tons), the combined increase in the last two years was over 38 per cent. It was stated that the increase of output in the second half of 1890 would have been much larger (the production in the first six months being 4,560,513 tons, and in the second six months 4,642,190 tons), had it not been for the blowing-out of many furnaces in December, which was caused by the strike of the Alabama coal miners and the financial stringency. As it is, the Americans may well be proud of a record which eclipses all former performances.

THE NORWEGIAN TIMBER TRADE IN 1890.—Last year Norway exported 1,848,000 cubic metres of timber of all kinds, as against 2,021,500 cubic metres in 1889, or 8½ per cent. less. Great Britain was the largest importer, taking more than half of the total quantity exported. The quantity of planed wood goods for building purposes exported was 8 per cent. less than in 1889. Of the total, 56 per cent. went to this country. Prices were, in consequence of over-production, very low, and will no doubt remain so. In consequence of this, all the leading saw-mills in Scandinavia have agreed to reduce this year their output by 25 per cent., representing about 350,000 standards. The wood pulp trade last year was in a wretched state, prices being ruinously low. Of mechanically-made pulp 205,000 tons were exported, against 190,000 tons in 1889, and as much in preceding years. Of chemical pulp 26,000 tons were exported, as against 25,000 tons in 1889. The value of the pulp exported is estimated at about 80,000*l.*

THE FRANKFORT ELECTRICAL EXHIBITION.—Exhibits are still received for the great electrical exhibition to be held in Frankfort between May 15 and October 15. The committee arranging the exhibition is styled Comité der Electrotechnischen Ausstellung zu Frankfurt am Main.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
Main Drainage Scheme	Girvan (N.B.) Police Commrs.	Not stated	Mar. 21
*Church at Winnington	The Committee	do.	Mar. 31
*Drawings for Laying-out and Development of Property	West of England Land and Investment Trst, Limited	25l. and 15l.	do.
*Technical School, Rochdale	The Committee	50l. and 25l.	Apl. 11
*Covered Market, Arcades, and Shops, Halifax	Markets and Fairs Committee	100l. 50l. and 30l.	May 1
*Cross Deaf and Dumb School	The Committee	Not stated	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Supply of Materials	Hendon Local Board	S. S. Grimley	Feb. 23
*Works and Materials	Mortlake Highway Bd.	H. Richards	do.
Eight Houses, Boothtown, Halifax		Geo. Buckley & Son	Feb. 24
*Roadmaking and Paving Works	Willesden Local Board	O. Claude Robson	do.
*Works and Materials	do.	do.	do.
Re-making Sidmouth-road	Newcastle-under-Lyme Town Council	Jas. Pattison	do
Thirty-one Cottages at Pontrhondda	Llwynypia Bldg Club	R. S. Griffiths	do.
New Branch Office, Coleraine	Belfast Banking Co. Lim.	S. P. Close	do.
Arch, Manchester Ship Canal	Runcorn Impt. Com.	*Official*	do.
School, Caretaker's House, Kitchen, &c.	Cardiff School Board	J. P. Jones	Feb. 25
Extension of Board School	do	Robinson & Salmon	do.
Enclosing and Fitting Show Yard, Exmouth	Devon County Agricultural Association	*Official*	do.
*Paving Works	Hackney Board of Works	J. Lovegrove	do.
*Works and Materials	Hammersmith Vestry	H. Mair	do.
Sewering, Kerbing, &c.	Handsworth U.S.A.	E. Kenworthy	do.
Additions to Hospital, Fusehill Workhouse, Carlisle	Guardians	Jas. Murchie	do.
Kerbs, Setts, Gullies, &c.	Gateshead Corporation	J. Bower	Feb. 26
Additions to Vicarage, Upton Bishop near Ross		Nicholson & Son	do.
Repairs, Public Baths	Northwich Local Board	*Official*	do.
Sewering, Paving, Levelling, &c. Back Ainley-street	Elland Local Board	G. Hepworth	do.
Pipe Sewers (2,330 feet)	Devonport Twn Coun.	John F. Burns	do.
Main Sewer, Doagh, Antrim	Guardians	J. Clark	do.
Three Retort Vaults, Hydraulic Mains, &c.	Heckmondwike Gas Co.	*Official*	do.
Three Houses, Belmont, Belfast	David Shaw	Saml. Stevenson	Feb. 27
Additional Water Supply	Largs Commrs.	W. R. Copland	do.
Re-roofing Church, Millfield, Ireland	Vestry	Thos. Drew	Feb. 28
Retort House, &c.	Burton-on-Trent T. C.	F. L. Ramsden	do.
Granite Road Metal	Lower Strafforth and Tickhill Highway Bd	*Official*	do.
Additions to Schools, Blaengarw	Llangeinor School Bd.	G. T. Lambert	do.
Five Dwelling Houses, St. Leonard's, Bodmin	J. B. Crocker	John Dennis	do.
*Supply of Materials	Wakefield U.R.S.A.	F. Massie	do.
Farm Buildings, House, and Infectious Diseases Hospital	Menston Asylum Committee, Yorks	J. V. Edwards	Feb. 30
*Footpaths and Materials	March Local Board	*Official*	Mar. 2
*Making-up Roads	Islington Vestry	do.	do.
Additions to Board School, nr. Wimborne	Kinson School Board	H. F. J. Barnes	do.
Pavilion, Bowling Green	Halifax Cricket and Football Club	Jackson & Fox	do.
*Isolation Hospital	Brentford Local Board	J. H. Strachan	do.
*Sewerage Works	Hornsey Local Board	T. de Courcy Meade	do.
*Making-up of Private Roads	do.	do.	do.
*New Isolation Block at Hospital	do.	do.	do.
*Foreman's House at Highgate Depôt	do.	do.	do.
*Works and Materials	do.	do.	do.
Brick Fence Wall	York Corporation	Alfred Creer	do.
Making Road and Laying Sewers	Ledbury Building Soc.	W. W. Robinson	do.
Laying Water Mains	Morley Corporation	Chas. Gott	do.
*Iron Bridges at Infirmary	St. Marylebone Guar.	A. Saxon Snell	do.
*Purchase and Pulling down Building Mat.	School Bd. for London	*Official*	do.
Township Offices	Killiney & Ballybrack Town Commrs.	Sir T. Deane & Son	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Works and Materials	Camberwell Vestry	*Official*	Mar. 2
*Sewers Works, Supply of Disinfectants, &c.	do.	do.	Mar. 3
Diverting Portion of Hebble Brook and Sewering	Halifax Corporation	E. R. S. Escott	do
Road Works	Wigton (Cumberland) Highway Board	John Sibson	do.
*Alteration and Extension of School	Burton-on-Trent Sch. B	R. Churchill	do.
*Works and Materials	Lewisham Bd. of Wks.	*Official*	do.
*New Warehouse	G. W. R.	do.	Mar. 4
*Painting York Station	N. E. R.	H. Copperthwaite	do.
Intercepting Sewer	Halifax Corporation	E. R. S. Escott	do.
Re-building "Black Bull Inn," Atwalton, near Bradford, Yorks		Jackson & Fox	do.
*Roadmaking and Paving Works	Fulham Vestry	W. Sykes	do.
*Pipe Sewers, &c.	do.	J. P. Norrington	do
*Supply of Broken Granite	Cranbrook R.S.A.	*Official*	do.
Granite Road Metal (10,000 tons)	Hardingstone High Bd.	do.	do.
Seven Cottages, Tantobie	Tanfield District Industrial Soc. Lim.		Mar. 5
*Escape Staircases	Wandsworth and Clapham Union	T. W. Aldwinckle	do.
*Works and Materials, Weymouth Sub-District	War Department	*Official*	Mar. 6
*Alteration and Additions to Workhouse	Tonbridge Union	W. Oakley	do.
Public Baths	Stafford Corporation	W. Blackshaw	do.
*Taking down and Re-building Lexford Bridge	Essex County Council	P. J. Sheldon	Mar. 7
*Stoneware Sewer Pipes and Gully Traps	Bath U.S.A.	C. R. Fortune	do.
Concrete Reservoir	Hetton-le-Hole & Easington-lane Water Co. Lim.	*Official*	do.
*Wrought-iron Fence, Entrance Gates, &c.	Beckenham Local Bd.	G. B. Carlton, C.E.	Mar. 9
*Laying of C. I. Pipes (Sea Water Scheme)	Bournemouth Twn C.	F. W. Lacey	do.
*Works and Materials	War Department	*Official*	do.
*Works and Materials, Shorncliffe Sub-District	do.	do.	do.
*Maintenance and Repair of Roads	Kent County Council	do.	Mar. 10
*Repairing Roads	Borough of Croydon	do.	do.
*Works and Materials	Rotherhithe Vestry	do.	do.
*Main Drainage Extension Works	West Ham Council	Lewis Angell	do.
*Thirty New Almshouses, Chapel, &c.	Trustees of Waddington Hospital Charity	W. Watson	Mar. 11
*Construction of Reservoir	Windermere Gas and Water Co.	J. Newton & Son	do.
*Road Materials and Team Labour	Norfolk County Coun.	*Official*	do.
*Works and Repairs, Building Materials, &c. Chatham	War Department	do.	Mar. 13
*Infectious Diseases Hospital	Borough of Blackburn	do.	Mar. 14
*114 to 124 Cottages	Blaina Cottage Building Co.	E. A. Johnson	do.
Fourteen Dwelling-houses, Holywell Green, Halifax		C. F. L. Horsfall & Son	do.
*Works, Materials, &c.	Bath U.S.A.	C. R. Fortune	do.
*Works and Materials (Gravesend Sub-District)	War Department	*Official*	Mar. 16
*Works, Repairs, Building Materials, &c. Aldershot	do.	do.	Mar. 18
Work at Congregational CLurch, Hanley, Staffs.		A. P. Miller	No date
Additions and Alterations to Public Buildings, Redhill	Redhill Market Hall Co.	Clayton & Black	do.
Detached Villa, Ilkley, Yorks		C. H. Hargreaves	do.
New Co-operative Stores, Loftus-in-Cleveland		Clark & Moscrop	do.
Leicestershire Road Metal and Slag	Towcester Highway Bd.	R. W. Rolfe	do.
New School Buildings and Alterations of existing Building, Darnall, Sheffield		C. J. Innocent	do.
New Stores	Broomhill (Northum.) Co-operative Soc.	Oliver & Leeson	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Street Inspector and Inspector of Nuisances	St. Giles Bl. of Works	130l.	Feb. 23
Sanitary, &c. Inspector	Worthing Twn Coun.	100l.	Feb. 25
*Engineer and Surveyor	Llandudno Impt. Com.	200l.	No date
*Clerk	do.	150l.	do.

Those marked with an Asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv., vi., vii., viii *and* ix. *Public Appointments, p.* xxi.

ELECTRIC LIGHTING FOR COVENTRY.—On the 10th inst., a special meeting of the Coventry City Council was held to adopt the necessary resolution as a preliminary to obtaining powers for the introduction of the electric light into Coventry. The Deputy-Mayor (Alderman Thomson) presided, and proposed "That application be made to the Board of Trade for a Provisional Order, under the Electric Lighting Acts, 1882 and 1888, authorising the Mayor, Aldermen, and citizens of the city of Coventry, to erect and maintain electric lines and works and produce, store, supply, and distribute electricity for public and private purposes within the city of Coventry, and that all proceedings heretofore taken in that behalf be confirmed." Mr. Andrews seconded, and the resolution was carried unanimously.

THE ENGLISH IRON TRADE.—The persistent sameness of the reports regarding the condition of the English iron trade which reach us week after week is becoming almost tantalising, and yet there are but slight signs of a change for the better. The iron market continues quiet, if not dull, the policy both with buyers and sellers being still to restrict their transactions to small quantities with short deliveries. Pig-iron has been tolerably steady during the week in the North of England and Scotland, but there is a tendency to weakness in Lancashire and the Southern districts, and sales below makers' quotations are reported. Bessemer iron is easier, and 1s. a ton lower, the depression being due partly to the large stock of hematite warrants, partly to the quietness in the steel trade. The business in finished iron is only moderate, and there has been a further drop in black sheets of 2s. 6d. a ton, owing to the inability of the sheet-iron makers to rehabilitate their combination. Tin-plates are rather quieter, but strong in tone. The shipbuilding trade is unchanged, but engineers report a decline in fresh orders.—*Iron.*

NEW PETROLEUM SPRINGS.—Russian journals state that petroleum springs of immense volume have been discovered near the town of Tvapse, on the Black Sea. They are situated so that the oil may be carried through iron mains direct into tank vessels, and it is expected that the new supply will greatly influence the Russian oil trade.

ROYAL ENGLISH OPERA HOUSE.—In our description of this building last week we omitted to mention that the whole of the exits are fitted with Kaye's "Patent Panic Fittings," as approved by the County Council. The swing doors with their automatic bolts allow the door to swing, but securely fasten when required.

ASSOCIATION OF MANCHESTER STUDENT ENGINEERS.—The fourth annual dinner of the Association of Manchester Students of the Institution of Civil Engineers took place on the 11th inst., in the Victoria Hotel, Manchester. Mr. J. Abernethy, past President of the Institution of Civil Engineers, presided. Mr. C. F. Budenberg proposed "The Institution of Civil Engineers," and, the chairman having replied, Mr. Thomas Ashbury proposed "The Association of Manchester Students." Mr. R. H. Heenan, the President, in responding, said that during his presidency he had tried his best to bring about the union of the students with the other members of the profession, because the example of the elder members could not be very well followed by those who had never seen them. He concluded by presenting to Mr. A. D. Greatorex, Assistant Borough Engineer of Southampton, an address and a timepiece in recognition of his services as secretary of the Association for the last four years. Mr. Greatorex expressed his thanks for the gift. The other toasts included "The Ship Canal" (proposed by Mr. L. B. Wells and responded to by Mr. E. Leader Williams).

MEETINGS.

SATURDAY, FEBRUARY 21.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." II. 3 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." III. 4.15 p.m.

Edinburgh Architectural Association. — Visit to Register House.

MONDAY, FEBRUARY 23.

Society of Arts (Cantor Lectures).—Mr. Gisbert Kapp on "The Electric Transmission of Power." II. 8 p.m.

TUESDAY, FEBRUARY 24.

Institution of Civil Engineers.—(1) Further Discussion on Messrs. Llewelyn B. and Claude W. Atkinson's paper on "Electric Mining-Machinery." (2, time permitting). Mr. J. Thornhill Harrison, on "The Subterranean Water in the Chalk Formation of the Upper Thames, and its Relation to the Supply of London." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. Charles Jones on "Scavenging, Disposal of Refuse and Sewage." 8 p.m.

Builders' Clerks' Benevolent Institution. — Annual General Meeting of Donors and Subscribers. 7.30 p.m.

Birmingham Architectural Association.—Mr. C. E. Bateman on "Castle Bromwich Church." 7.30 p.m.

WEDNESDAY, FEBRUARY 25.

Carpenters' Hall (Free Lectures to Artisans).—Professor J. W. Groves on "Timber: its Growth and Decay." 8 p.m.

St. Paul's Ecclesiological Society.—Paper by Mr. E. P. Loftus Brock, F.S.A., entitled, "Notes on the Ancient Churches of Middlesex." 8 p.m.

THURSDAY, FEBRUARY 26.

Society for the Encouragement of the Fine Arts.—Mr. Alfred Gilbert on "The Moral and Intellectual Influences of Music." 8 p.m.

Society of Antiquaries.—8.30 p.m.

Institution of Electrical Engineers.—8 p.m.

FRIDAY, FEBRUARY 27.

Institution of Civil Engineers (Students' Meeting).—Mr. B. Chatterton on "Disintegrators." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. Shirley F. Murphy on "Infectious Diseases and Methods of Disinfection." 8 p.m.

Society of Arts (Popular Afternoon Lectures).—Captain Abney, F.R.S., on "The Science of Colour." 4.30 p.m.

SATURDAY, FEBRUARY 28.

Architectural Association.—Visit to St. Stephen's Church, Stepney.

Builders' Foremen and Clerks of Works' Institution.—Annual dinner, Holborn Restaurant. 6 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S, on "The Forces of Cohesion." III. 3 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." IV. 4.15 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

2,792.—APPARATUS FOR CARRYING PLATE-GLASS: *J. J. Spear.*—This invention relates to an apparatus lifting on two hooks secured to conveyance and easily raised; made of wood and iron, the flat surface being covered with felt so as to form a soft bed on which the plate will rest. Wood buttons support the glass when putting on and off, and when flat two rollers will take the back weight and run themselves clear.

3,285.—BRICK-MAKING MACHINERY: *W. Sayer.*—In order to prevent the clay or plastic material from clogging, the knives, cutters, or worms, the pugging or expressing knives, and worms are made of a rounded section from where the knive-blade joins the boss to the periphery.

3,481.—GAS OR OIL STOVES AND BOILERS: *J. T. Spencer.*—According to this invention, mirrors or reflectors are arranged on the door of stove, so that stooping to regulate the flame is unnecessary.

7,601.—GULLY TRAPS: *J. W. Walsh.*—The trap which is the subject of this patent is made in one piece with trap, dish-stone, and double dip-seal, with a ventilator and inspection hole between them. The waste and slop water pass through a loose cast-iron perforated grating into a small trap-chamber, preferably formed with a rounded bottom without angles so as to prevent any deposit occurring; two dips, the one nearest the house being deeper than the other, dip down into this chamber or bend, and, beyond those and at a point higher than either, the exit to the drain is placed; between the two dips is an inspection or cleaning-hole which is closed by a plate of clay or iron covered with asphalte or some impervious substance placed above the level of the overflow to the drain, and, below this hand hole but still in the air space above the water-line, is a branch-pipe leading to the open-air outside the house. If the pressure is too strong, and it passes the first dip, it rises into the intermediate air-chamber, thence through the ventilating-pipe, and into the outside air, the greater depth of the second dip preventing its going farther and entering the house. The trap is set level and then the two water-seals are perfect.

16,328.—SPIRIT-LEVELS: *H. Green.*—The glass carrying the spirit and bubble is curved, and shows, in connexion with an indicator or plate, on the stock of the level, the angle at which it is moved.

18,742.—PARQUET FLOORING: *J. Idrac.*—This invention relates to a cheap form of parquetry, is termed "parquet surchênés," and is made of compound blocks, —*i.e.*, only the upper part of each block is composed of expensive wood, the lower or under part, which only serves to support and strengthen the upper part, is of cheap wood, the two parts being secured together by glue and by being dovetailed together by a novel form of joint.

NEW APPLICATIONS FOR PATENTS.

February 2.—1,847, J. Mellor, Door Check and Closer. —1,852, G., J., and M. Clarke, Water-closets, &c.—1,875, R. Fisher, Heating Buildings.—1,885, H. Symons, Slate Slip for Repairing Slated Roofs.

February 3.—1,936, J. Wild, Combined Gully and Flusher for Sewage and Closets.—1,940, H. Herrmann, Parquet Floor.—1,959, H. Lake, Fire Grates.

February 4.—1,995, R. Hield, Hinges.—2,001, T. Hughes, Construction of Artisans' Dwellings or Workmen's Cottages.—2,012, J. and J. Campbell, Flush Cisterns.—2,013, E. Mobbs, Flushing Water-closets, &c. —2,017, J. McGlashan and E. Braidwood, Fireproof Decorative Material for Ceilings, Walls, Woodwork, &c. —2,071, G. Blanks and B. Lefebure, Dry-press Brick-making Machines.—2,078, W. Munns, Door Stop.—2,080, W. Munns, Stone-crushing Machine.

February 5.—2,111, R. Foulkes and others, Jointing Drain or other Pipes.—2,116, J. Aspinall, Whitewash-brushes.

February 6.—2,229, A. Jolliffe, Attaching Door-knobs to Lock-spindles.

February 7.—2,273, C. and J. Houldsworth, Wind, Dust, and Rain Excluder for Doors.—2,278, F. Smith, Baker's Ovens.—2,288, J. Bartlett, Ventilating Cowls.

PROVISIONAL SPECIFICATIONS ACCEPTED.

20,638. R. Stanley, Boring or Tunnelling Machines.—21,035, D. McKellar, Bench Stops.—21,087, J. Sepulchre, Increasing and Regulating the Draught of Fire-places and Stoves.—21,120, J. Longworth, Closing, Latching, and Opening Doors.—8, J. Kaye, Stops for Doors, Gates, &c.—17, T. and E. Collinson, Glazing Roofs, &c.—70, C. Sharp and J. Firth, Fire-grates.—124, J. Bobart, Open Fireplaces.—169, N. Dennys, Anti-fonling Paint for Wood and Metal.—473, A. Spanier, Fireplaces.—596, E. Wright, Fireplaces and Cooking-ranges.—631, C Day, Prevention of Smoke from Fireplaces.—747, W. Redish, Fire-grates.—757, A. Carns, Disinfecting Apparatus.—977, W. Smail and J. Ewart, Roof-gutters.—1,078, G. Charlton, Reversible Windows.—1,147, G. Heaton, Cottage Dwellings.—1,337, W. Munns, Building Construction —1,345, H. Burnet, Preventing Water-pipes from Bursting.—1,358, E. Smith, Parquet Flooring.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

16,473, E. Blount, Door Check.—19,446, H. Dwight and others, Hanging of Doors.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

FEBRUARY 10.—By *Phillips & Dyer:* 39, Queen's-rd., St. John's Wood, u.t. 46 yrs., g.r. 15*l.*, 800*l.*; 54, Alfred-rd., Paddington, u.t. 58 yrs., g.r. 5*l.*, 315*l.*—By *T. B. Westacott:* 1, Rhodes-st., Barnsbury, u.t. 67 yrs., g.r. 5*l.*, r. 30*l.*, 240*l.*; 24, Nailour-st., Caledonian-rd., u.t. 60 yrs., g.r. 10s., r. 39*l.*, 300*l.*; 13, Twyford-st., u.t. 53 yrs., g.r. 3*l.* 10s., r. 34*l.*, 425*l.*—By *Dunn & Soman:* 111, Hopton-rd., Streatham Common, f., 630*l.*

FEBRUARY 11.—By *Messrs. Aldridge:* 20, Osborne-rd., Thornton Heath, and a plot of land, f., 300*l.*—By *Alderton & Co:* F.g.r. of 10s., with reversion in 43 yrs, Atkins-rd., Clapham, 500*l.*; f.g.r. of 35*l.*, with revrsion in 33 yrs, Thornton-rd., 3,000*l.*; f.g.r. of 31*l.*, with reversion in 33 yrs., South-rd., 2,250*l.*; f.g.r. of 10*l.* and 15*l.* 14s., with reversion in 33 and 43 yrs., 1,270*l.*; f.g.r. of 77*l.*, with reversion in 33 yrs., Atkins-rd., 4,595*l.*; f.g.r. of 182*l.* 10s., with reversion in 33 yrs., Thornton-rd., 7,695*l.*; f.g.r. of 4*l.*, with reversion in 43 yrs., Clarence-rd., 1,310*l.*; f.g.r. of 30*l.*, with reversion in 33 yrs., 2,220*l.*; f.g.r. of 25*l.*, with reversion in 33 yrs., King's-rd., 1,400*l.*

FEBRUARY 12.—By *Hoppe & Sowdon:* No. 528, Commercial-rd., E., c., 260*l.*; No. 116, Whitehorse-st., u.t. 11 yrs., g.r. 21*l.*, r. 55*l.*, 30*l.*; 115, Brook-street, u.t. 29 yrs., g.r. 10*l.*, r. 36*l.*, 105*l.*—By *Newbon & Co.:* 55, Albion-grove, Barnsbury, u.t. 52 yrs., g.r. 7*l.*, r. 44*l.*, 450*l.*—By *Weston & Son:* 1 to 5, Lansfield-ter., Streatham, f., 1,000*l.*; 16 to 24, Burgoyne-rd., Stockwell, u.t. 76 yrs., g.r. 25*l.*, r. 143*l.*, 955*l.*; 28, Burgoyne-rd., u.t. 76 yrs., g.r. 5*l.*, r. 28*l.* 12s., 220*l.*; 3 and 11, Lawrence-rd., Brixton, u.t. 58 yrs., g.r. 10*l.* 10s., r. 82*l.*, 525*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS

TIMBER.		
Greenheart, B.G. ton	6/10/0	7/15/0
Teak, E.I... load	8/10/0	14/0/0
Sequoia, U.S.ft.cu.	2/3	3/0
Ash, Canada load	2/10/0	4/5/0
Birch, do.	2/5/0	4/5/0
Elm, do.	3/10/0	4/15/0
Fir, Dantsic, &c.	2/0/0	3/15/0
Oak, do.	2/10/0	4/10/0
Canada.....	4/17/6	6/10/0
Pine, Canada red	2/10/0	3/10/0
Do, yellow	2/0/0	5/10/0
Lath, D'ntsic, fath	5/0/0	6/0/0
St. Petersburg	5/0/0	7/0/0
Deals, Finland, 2nd & 1st std 100	7/0/0	10/0/0
Do, 4th & 3rd..	7/0/0	8/0/0
Do. Riga	6/0/0	7/10/0
St. Petersburg, 1st yellow ..	9/0/0	14/0/0
Do. 2nd yellow	8/0/0	9/0/0
Do. white	6/10/0	10/0/0
Swedish	6/10/0	15/0/0
White Sea	8/0/0	16/10/0
Canada, Pine 1st	13/0/0	24/0/0
Do. do. 2nd....	9/0/0	15/10/0
Do. do. 3rd, &c.	6/10/0	10/0/0
Do. Spruce. 1st	8/10/0	10/10/0
Do. do. 3rd & 2nd.....	6/0/0	7/10/0
New Brunswick	5/0/0	7/0/0
Battens, all kinds	4/10/0	15/10/0
Flooring Boards, sq., 1 in. prep. 1st	0/10/0	0/14/0
Do. 2nd.....	0/9/0	0/10/6
Other qualities	0/5/0	0/7/6
Cedar, Cuba ..ft.	3½	4½
Honduras, &c.	3½	4½
Mahogany, Cuba.	4½	6½
St. Domingo, cargo av	4½	6½
Mexican do. do	4½	5½
Tobasco do. do	5½	6½
Honduras do..	5½	6½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio.....	12/0/0	19/0/0
Bahia	10/0/0	18/0/0

TIMBER (*continued*).		
Satin, St. Domingo .....ft.	0/0/9	0/1/3
Porto Rico	0/0/10	0/1/6
Walnut, Italian..	0/0/4	0/0/7
METALS.		
IRON—Bar, Welsh, in London..ton	6/5/0	6/15/0
Do. do. at works in Wales	5/15/0	6/5/0
Do. Staffordshire, in London	6/5/0	7/0/0
COPPER—British, cake and ingot	56/0/0	57/0/0
Best selected ..	59/0/0	60/0/0
Sheets, strong..	66/0/0	0/0/0
Chili, bars	52/10/0	0/0/0
YELLOW METAL lb.	0/0/6	0/0/6½
LEAD—Pig, Spanish....ton	12/8/9	12/10/0
English, com. brands	0/0/0	12/12/6
Sheet, English, 3 lbs. per sq. ft. and upwards ..	14/10/0	15/0/0
Pipe	15/0/0	0/0/0
ZINC—English sheet .....ton	27/10/0	0/0/0
Vieille Montagne.....	28/5/0	0/0/0
TIN—Straits	90/10/0	0/0/0
Australian	90/15/0	0/0/0
English Ingots	94/10/0	0/0/0
OILS.		
Linseed .....ton	21/15/0	22/0/0
Cocoanut, Cochin	35/15/0	0/0/0
Do. Ceylon	29/0/0	0/0/0
Palm, Lagos	26/0/0	0/0/0
Rapeseed, English pale	28/10/0	28/15/0
Do. brown	27/0/0	27/5/0
Cottonseed ref...	19/0/0	0/0/0
Oleine	22/0/0	24/0/0
Lubricating, U.S.	6/0/0	7/0/0
Do. refined	7/10/0	12/0/0
TAR—Stockholm barrel	1/1/6	1/2/0
Archangel	0/14/6	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BRENTFORD.—For constructing a new road round the Recreation Ground, for the Brentford Local Board. Mr. J. H. Strachan, Surveyor:—

Killingback & Co. ..	£1,432	0 0	Pizzey & Son	£1,250	13 8
Nowell & Robson....	1,374	0 0	Atkins	1,130	0 0
Mowlem & Co.	1,270	0 0	Ball, Chiswick*	1,080	0 0

* Accepted.

BRENTFORD.—For making-up private portion of St. Paul's-road, for the Brentford Local Board. Mr. J. H. Strachan, Surveyor:—

Mowlem & Co.....	£437	0 0	Nowell & Robson £363 0 0
H. Lee	385	0 0	J. Ball, Chiswick*.... 320 2 6
G. Bell	381	0 0	* Accepted.

BRISTOL.—For pulling down Nos. 113 and 115, Stoke's Croft, and erecting new premises on the site, for Mr. W. J. Hooper. Mr. Herbert J. Jones, architect, Wellington Chambers, 12, Bridge-street, Bristol. Quantities by the architect:—

E. T. Hatherly	£2,243	E. Walters.....	£1,990
Eastabrook & Sons	2,229	J. E. Davis	1,963
W. Church	2,216	Cowlin & Son	1,947
Brock & Son.....	2,060	J. Perrott	1,934
J. Wilkins.....	2,048	Wilkins, R., & Sons*.....	1,889
G. Humphreys.....	2,030	* Accepted.	

[All of Bristol.]

CARDIFF.—For works in connexion with the Dynas Powis water-supply, for the Union Rural Sanitary Authority. Mr. W. Fraser, Surveyor, 14, Radnor-road, Canton, Cardiff:—

No. 1 *Contract.—Excavation and Filling-in, &c., for Water-mains and Fittings.*

Cross Bros.	£551	13 4	Geo. Hartland..... 135 16 8
Robert Harry	307	10 0	Edmund Lewis 72 10 0
Lees & Garland	256	5 0	H. J. Davies..... 67 18 4
Batchelor & Snowdon	229	2 6	G. C. Adamson, Cadoxton (accepted) 57 1 8
Cram & Hadley	220	0 0	

No. 2 *Contract.—For Supplying and Laying and Fixing of Water-mains and Fittings.*

J. G. Proger	£346	13 0	Cross Bros., Cardiff*.. 274 5 2
Batchelor & Snowdon	308	0 0	H. J. Davies..... 268 6 8

* Accepted.

Work in both cases tendered for on a schedule of prices, according to net measurements.

CARLISLE.—Accepted for the erection of ten houses in Morley-street, for Mr. J. J. Fearnley. Mr. H. H. Hodgkinson, architect, 33, Bank-street, Carlisle:—

Builders.—G. & N. Bell	£990 0 0
Joiner.—J. Hendson	353 0 0
Plasterer.—J. Harrington.....	113 0 0
Slater.—J. Smith	94 4 7
Plumber.—W. J. Wilson (accepted)	67 7 6
Painter.—S. Allan	29 18 6
Ironfounder.—J. Edmondson	17 0 0

[All of Carlisle.]

CASTLEFORD.—For paving, flagging, &c., Oxford-street, for the Local Board. Mr. H. H. Broadbent, Surveyor, Local Board, Castleford. Quantities supplied:—

Feather & Speight, Mirfield.....	£3,333	15 2½	D. Speight..... £3,115 0 0
Towler & Speight ..	3,331	3 2	Josh. Speight 3,088 17 6
Geo. Walker	3,267	3 11	C. Lovedale, Leeds * 2,862 0 0
			* Accepted.

DUFFTOWN (N.B.)—Accepted for the erection of a new infant school and about 400 yards of enclosing walls, for the Mortlach School Board. Mr. Geo. Sutherland, architect, Elgin, N.B.:—

Builder.—R. & J. Mitchell, Huntly.
Carpenter.—Donald McKay, Dufftown.
Plumber.—John Wilson, Huntly.
Plasterer.—Geo. Gray, Elgin.
Slater.—Geo Murray, Lossiemouth.
Painter.—Edward J. Garden, Dufftown.

EARLESTOWN.—For the erection of new schools for the Earlestown District School Committee. Messrs. B. S. & F. Biram, architects, Hardshaw-street, St. Helens:—

Wm. Harrison	£2,100	Kellet & Barker	£1,875
Thos. Rotherham	2,040	Wm. Molyneaux.....	1,734
Jno. Whittaker	1,925	Jno. Unsworth, Earlestown (accepted)	1,725
Peter Tickle	1,891		

ENFIELD HIGHWAY.—For the erection of twenty-three cottages, St. Stephen's-road, Enfield Highway, for Mr. W. G. Bodecker. Mr. Edward Clarke, architect:—

J. & H. Cocks	£6,299	J. Todd	£5,090
W. Shurmur.....	5,490	J. Ansell	4,597
T. Boyce.....	5,471		

HALIFAX.—Accepted for the enlargement of works and foundry abutting on the Victoria Cattle Market. Mr. T. Lister Patchett, architect:—

Masons and Bricklayers—Clough & Greenwood ..	£147	0	0
Carpenter and Joiner—W. H. Noble	100	0	0
Plumber and Glazier—C. A. Walshaw.....	38	0	0
Slaters and Plasterers—S. Pickles & Sons	27	0	0
[All of Halifax.]			
Total	£312	0	0

HOUNSLOW.—For alterations and repairs to Gunnersbury House, for Dr. Willett, J.P. Mr. S. Woodbridge, jun., architect and surveyor, Brentford:—

R. Knight	£506 0 0
H. J. Robinson, Brentford (accepted)	443 0 0

ISLEWORTH.—For sanitary work at Nos. 55, 57, and 59, Church-street, Isleworth, and connecting drains with the main sewer, &c., for Mr. C. Blythe. Mr. S. Woodbridge, jun., surveyor, Brentford:—

Hopper (accepted).....	£143 0 0

LEAMINGTON.—For extensive additions and alterations to Warneford Hospital buildings, for the Committee of Management. Mr. Keith D. Young, architect, 17, Southampton-street, Bloomsbury, W.C. Quantities by the architect:—

Dawkes	15,282	10	Shillitoe & Son £13,725 0
Bowen.....	15,192	0	Willcock..... 13,907 0
White	14,947	0	Kimberley, Banbury (accepted) 13,180 0
Smith & Sons	14,657	0	Claridge & Bloxham .. 13,030 0
Bradney & Co.....	14,642	0	Jenkins & Sons 12,840 0
Foster & Dicksee.....	14,250	0	Wright & Robinson .. 12,510 0
Reed, Blight, & Co. ..	13,799	0	
Fell	13,774	0	

LEEK.—Accepted for the new police station buildings, for the Standing Joint Committee of the Quarter Sessions and the County Council of Stafford. Messrs. W. Sugden & Son, architects. Quantities by the architects:—

Excavator, Bricklayer, Mason, Tiler, and Plasterer—Thomas Grace, Leek	£3,000 0 0
Carpenter and Joiner—Henry Carding, Leek ..	825 0 0

LONDON.—For repairs, &c., to premises, Wellclose-square, St. George's, E., for the London County Council:—

F. & F. J. Wood	£499	0 0!	Battley £255 0 0
Richardson Bros. ..	375	10 0	Stevens Bros. 246 0 0
Davis Bros.	337	0 0	Watts 240 0 0
Calnan & Co.....	322	0 0	Powditch 237 0 0
Henry.....	310	0 0	Willson 237 0 0
Geo. Barker	305	0 0	Knight 227 0 0
Cooper	295	0 0	Fowler 219 0 0
Jesson	290	0 0	Simms 199 0 0
McSwiney	287	0 0	Wells ..... 190 0 0!

LONDON.—For pulling down and rebuilding the "Northampton Arms," Goswell-road, E.C., and shop adjoining, for Mr. J. Durrant Spires. Mr. H. I. Newton, architect, 49, Victoria-street, Westminster, S.W. Quantities by Mr. F. Thomson, 5, Great James-street, Bedford-row, W.C.:—

F. Mark.....	£7,993	H. Burman & Son	£7,400
Mattock Bros.	7,877	S. R. Lamble	7,252
S. Godden	7,583	C. Dearing & Son.....	7,066
Patman & Fotheringham..	7,523		

LONDON.—For alterations and decorations at No. 33, Stanhope gardens, S.W. Mr. W. H. Collbran, architect:—

Hearn & Co.	£4,289	Wm. Park	£3,246
H. Smith & Co.	3,414	Holdstock	2,900

LONDON.—For erecting pianoforte factory at No. 7, St. George's road, Regent's Park, N.W. Mr. Alfred Conder, architect, Palace-chambers, Westminster. Quantities by Mr. Theodore Thorn, 63-Finsbury-pavement, E.C.:—

W. Goodman	£3,593	E. Lawrance & Sons	£3,309
G. Munday & Sons.....	3,445	John Greenwood	3,187
Wm. Scrivener & Co.....	3,328	Edmund Toms (accepted)..	3,129

LONDON.—For alterations to the "Kentish Drovers" public-house, Old Kent-road, S.E., for Mr. D. McLean. Messrs. Waring & Nicholson, architects:—

Tyerman	£1,680	J. Marsland	£1,595
Spencer & Co.....	1,650	J. Mills	1,543
Wm. Smith	1,597	Sabey & Son	1,479
Canning & Mullen.....	1,595		

LONDON.—For erecting oil refinery at the Victoria Oil and Candle Works, Warton-road, Stratford, for Messrs. Palmer & Company. Messrs. J. S. Newman & Jacques, architects, 2, Fen-court, E.C. Quantities by Messrs. R. L. Curtis & Sons:—

Morter	£900	Reed	£873
Hosking.....	898	Gregar, Stratford (accepted)	743
Hearle & Son	892		

LONDON.—For alterations to No. 4, Blenheim-street, W. Mr John Hamilton, architect:—

J. Godfrey & Son	£489	W. Shurmur	£459
S. Hayworth	474	Snewin Bros. & Co., Upper Clapton (accepted).....	445
E. Collins	460		

LONDON.—For rebuilding No. 56, Old Kent-road, for the London and Provincial Bank, Limited. Mr. A. B. Hutchings, architect:—

Charteris	£1,120	S. J. Jerrard*	£929
Balaam Bros.....	930	* Accepted.	

LONDON.—For alterations, additions, and repairs, at No. 388, Essex-road, Islington, for the London and Provincial Bank, Limited. Mr. A. B. Hutchings, architect, 14, Victoria-street, Westminster:—

Anley	£483	S. J. Jerrard (accepted)	£477

NORWICH.—For the erection of a new infectious diseases hospital at North Heigham, for the Corporation. Mr. P. P. Marshall, City Engineer, Guildhall, Norwich:—

Horace Lacey	£5,434	Wilkin & Wilkins	£4,830
Robt. Wegg	5,229	R. W. Bennett*.....	4,290
Smith & Watling	5,122	* Accepted.	
Youngs & Son	5,084	[All of Norwich.]	

OLDCASTLE (Ireland).—For alterations and improvements to public-house in Cavan-street, for Casey's Drogheda Brewery Company, exclusive of painting. Mr. A. Scott, architect:—

P. L. Scott	£350	Thos. Grace, Oldcastle*	£306
M. Keernan	386	* Accepted.	

PEEL (near Gosport).—For the erection of a residence for Mr. E. Leane. Mr. Harry A. F. Smith, architect, Gosport:—

J. Croad	£1,202	J. Dugan	£1,100
J. Crockerell.....	1,160	J. Plummer, Fareham* ..	999
Wareham	1,143	* Accepted.	

PENRYN (Cornwall).—For the erection of new Wesleyan chapel and school buildings, for the Wesleyan Trustees. Mr. J. Wm. Trounson, architect, 27, Clarence-street, Penzance :—

G. G. Powell	£4,000	A. Carkeek, Redruth*	£3,396
Thomas Rickard	3,907	Pooley	3,378
W. H. Stephens	3,900		

* Accepted.

PENZANCE.—For alterations and additions to 9, St. Mary's-terrace, Penzance, for Mr. Lanham. Mr. Oliver Caldwell, architect, Penzance :—

Mason Work.

John Burnett	£270	Alfred Trythall	£245
Rowe & Pidwell	270	William Ford, Penzance*	218

Carpenter's Work.

Joseph James, Penzance*	£228	W. H. Trounson	242

* Accepted.

SEVENOAKS.—For levelling, metalling, kerbing, tar-paving, draining, &c., Gordon-road, for the Local Board. Mr. Jabez Mann, Surveyor, Local Board Offices, Sevenoaks :—

E. & W. Iles	£916	3	0
Henry Lee	795	0	0
David Mauchn	675	10	0
Sidney Hudson, West Dulwich*	665	9	7

* Accepted according to schedule of prices.
[Surveyor's estimate, £708 0s. 0d.]

SHEPPERTON (Middlesex).—For alterations and additions to (exclusive of stables and entrance lodge) "The Poplars," Lower Halliford, near Shepperton, Middlesex, for Mr. Stone-Wigg, J.P. No quantities supplied. Mr. James Neale, F.S.A., architect, 10, Bloomsbury-square, London, W.C. :—

Thos. Knight & Sons, Chertsey	£1,297 10 0	Joseph Norris, Sunningdale*	1,204 10 0

* Accepted.

SOUTHAMPTON.—For providing and fixing a heating apparatus, boilers, slipper-baths, water-tanks, &c., at the new Public Baths, for the Corporation. Mr. W. B. G. Bennett, Borough Surveyor, Southampton :—

J. Smeaton & Co.	£1,467 0 0	J. Bradford & Co., London (accepted)	£1,025 0 0
T. Wood & Co.	1,451 17 8		
J. E. Boaz	1,200 0 0	Roe & Co.	890 0 0
J. & F. May	1,195 0 0	Thomas & Taylor	790 10 0
Russell & Co.	1,076 0 0	W. Summerscales & Son	648 0 0

STOKE-ON-TRENT.—For the erection of a detached house, Regent-street, Stoke-on-Trent, for Mr. W. Heath. Quantities supplied. Mr. A. R. Wood, architect, Tunstall, Staffs. :—

Thomas Cooper, Tunstall (accepted) £565 0 0

TARA (Ireland).—Adjourned tenders on modified plans for building medical residence, &c., for the Dunshaughlin Board of Guardians. Mr. A. Scott, architect, Navan, Ireland :—

P. O'Brien	£1,200	Thos. Mackey, Dublin*	£1,300
Luke Madden	1,295		

* Accepted.

TISBURY (Wiltshire).—For alterations and additions to Pyt House, Tisbury, Wilts, for Mr. V. F. Benett-Stanford. Mr. C. Stanley Peach, architect, 8, John-street, Adelphi, W.C. :—

J. Shillitoe & Sons	£16,500	A. Estcourt & Son	£15,593
Stephens & Bastow	16,499	Holliday & Greenwood	14,777
H. J. Sanders	15,860		

TUNSTALL.—For additions and alterations to Woodland Pottery, for Messrs. W. H. Grindley & Co. Quantities supplied. Mr. A. R. Wood, architect, Tunstall :—

Charles Cope, Tunstall (accepted) £5,700 0 0

TUNSTALL.—For the erection of shop premises, High-street, Tunstall, for Mr. E. Timmis. Quantities supplied. Mr. A. R. Wood, architect, Tunstall :—

Yorke & Goodwin, Tunstall (accepted) £550 0 0

TUNSTALL.—For the erection of business premises, High-street, Tunstall. Quantities supplied. Mr. A. R. Wood, architect, Tunstall :—

Yorke & Goodwin, Tunstall (accepted) £1,800 0 0

WALTHAMSTOW.—For rebuilding the "Rose and Crown" public-house, Hoe-street, Walthamstow. Mr. Fred. A. Ashton, architect :—

Whitehead & Co.	£3,120	Harris & Wardrop	£2,817
Staines & Son	3,076	G. E. Todd	2,727
F. & F. J. Wood	2,975	W. Shurmur (accepted)	2,646

WATFORD.—For new dyeing, cleaning, and carpet-beating works for the Watford Steam Laundry Co., Limited. Messrs. Ayres & Ardron, architects :—

T. Turner, Limited	£1,475	C. Brightman	£1,282
Andrews & Son	1,320	O. & J. Waterman	1,272
Clifford & Gough	1,299	H. M. Dove (accepted)	1,225

WELLINGBOROUGH.—For the erection of three houses, Midland-road, for Messrs. Shovey & Brown. Mr. A. Sykes, architect, 34, Walbrook, London :—

R. Marnott	£750	G. A. Smith	£730
W. Stevens	747	H. Dorman	728
J. Hudson	740	H. T. Harrison	722
G. Hacksley	737	J. Underwood	700

WIMBORNE.—For the erection of a new school and offices at Heatherlands, Parkstone, Dorset, for the Kinson School Board. Messrs. Lawson & Donkin, architects, Bournemouth :—

W. Scott	£1,175 0 0	W. H. C. Curtis	£891 0 0
J. W. Street	1,091 17 6	G. Beven	763 12 0
R. Allner	995 0 0	Newman & Rigler, Parkstone*	677 0 0
T. C. Rigler	900 0 0		

* Accepted.

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Walnut Dadoes ,, 1s. 11d. ,,
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Solid 1-inch Oak, straight boards, laid and polished, at £6. 18s. a square.
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All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

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J. & A. CREW, Cumberland Market, London, N.W.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

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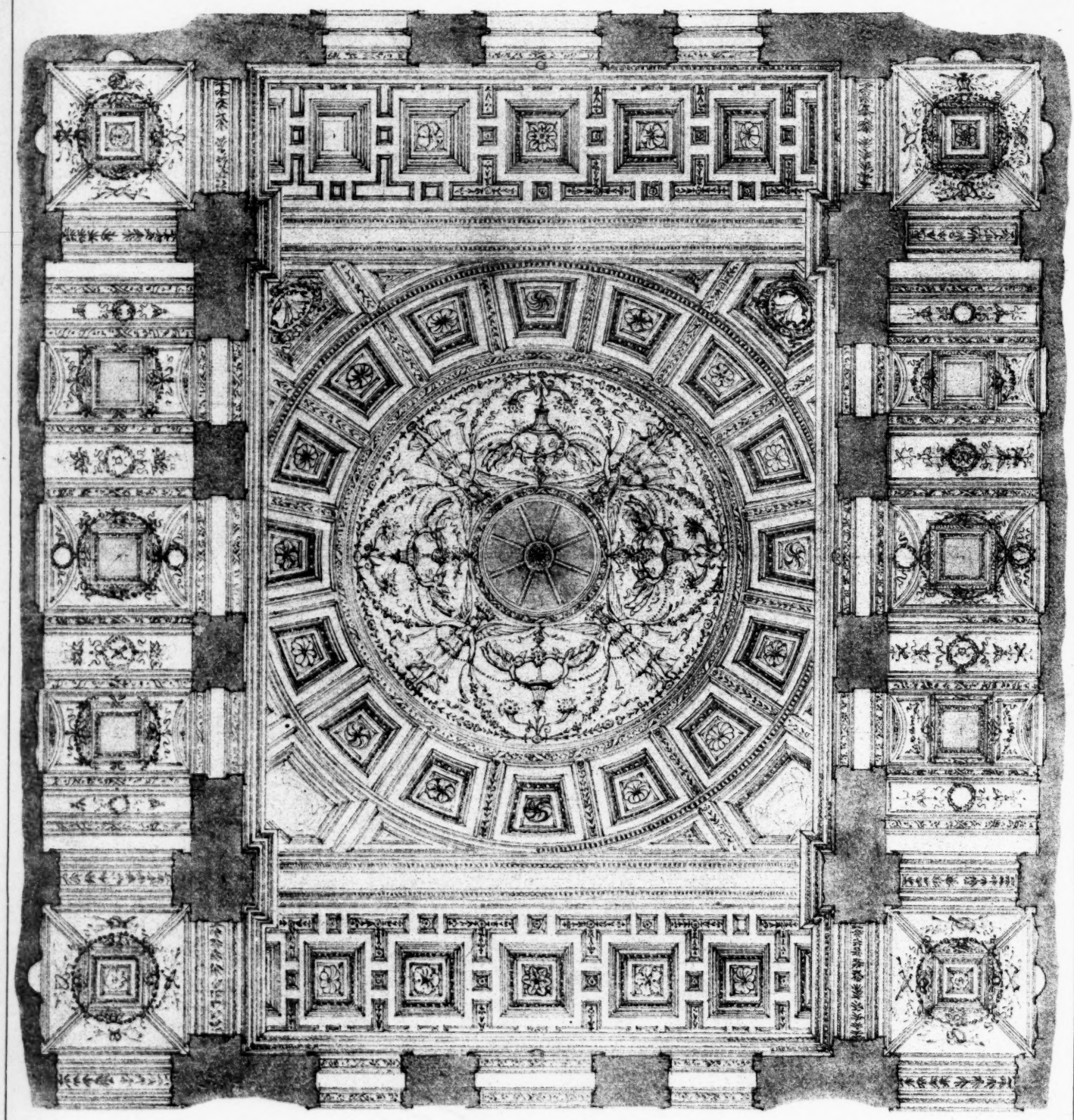
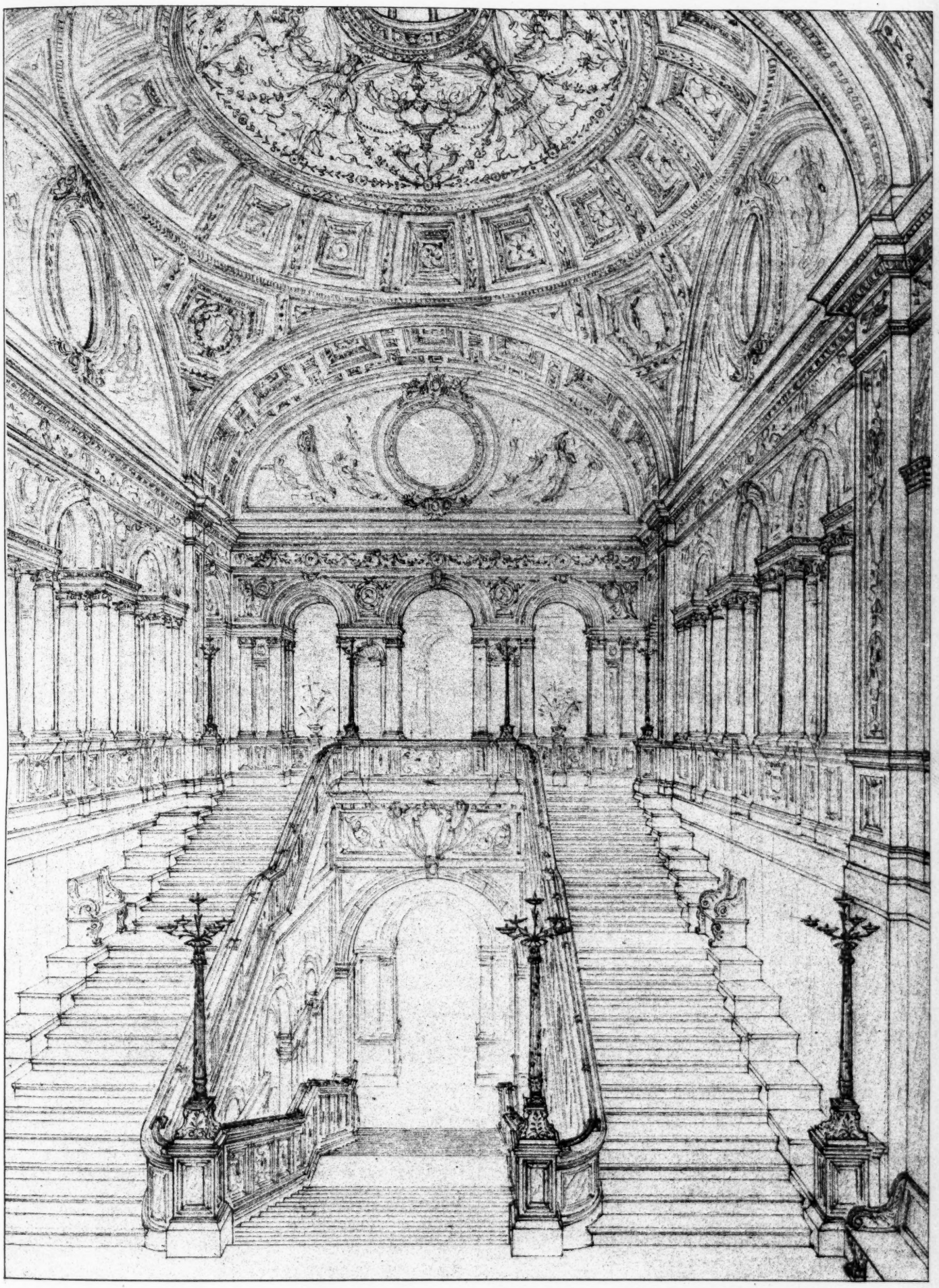


Ceiling Plan.

"INK-PHOTO" SPRAGUE & Co. 22, MARTINS LANE, CANNON ST., LONDON, E.C.

DESIGN FOR STAIRCASE FOR A LARGE TOWN MANSION.—By Mr. A. Mackintosh.

Tite Prize, R.I.B.A., 1891.



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DESIGN FOR STAIRCASE FOR A LARGE TOWN MANSION.—By Mr. A. Mackintosh.

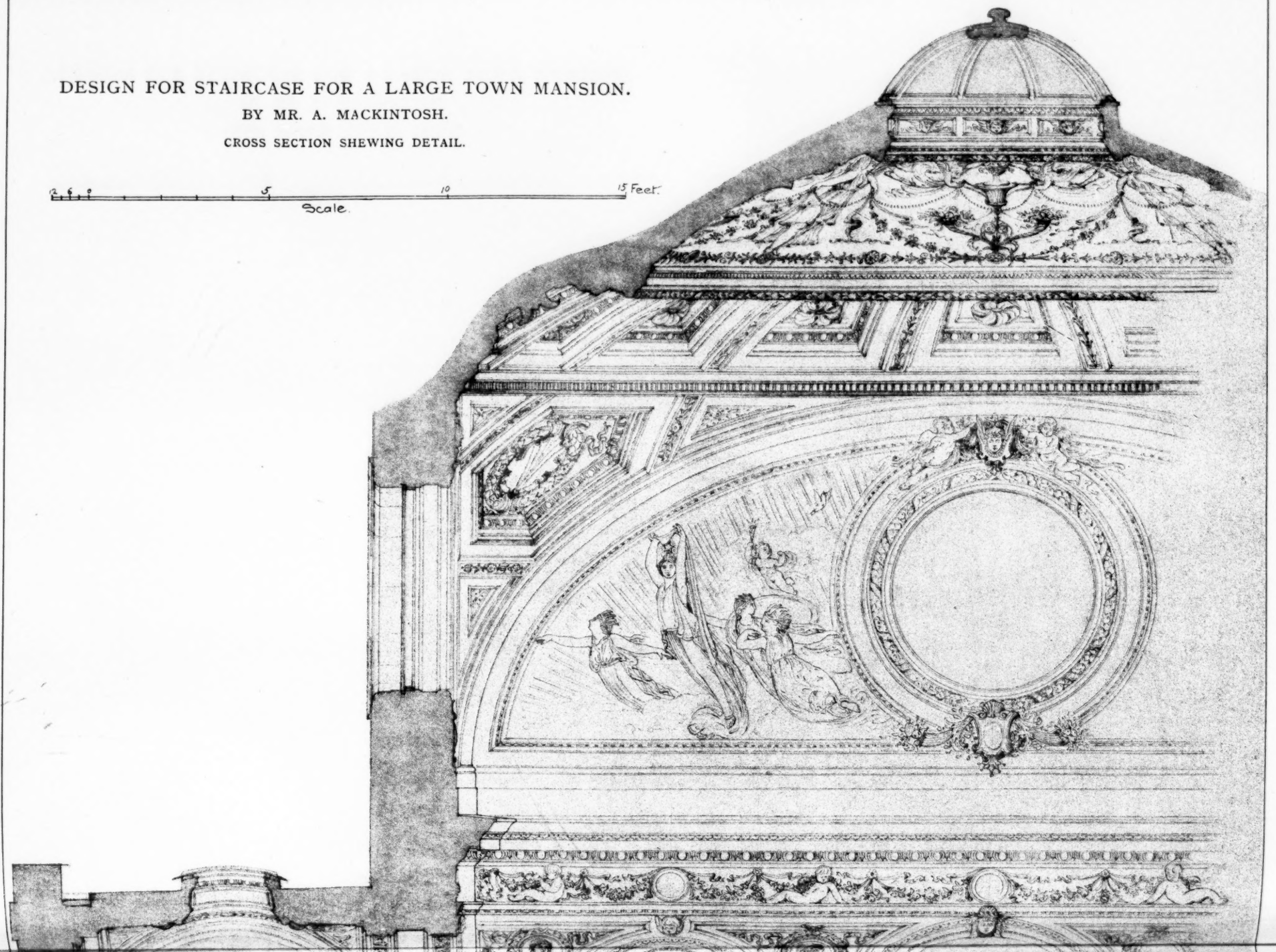
PERSPECTIVE VIEW.

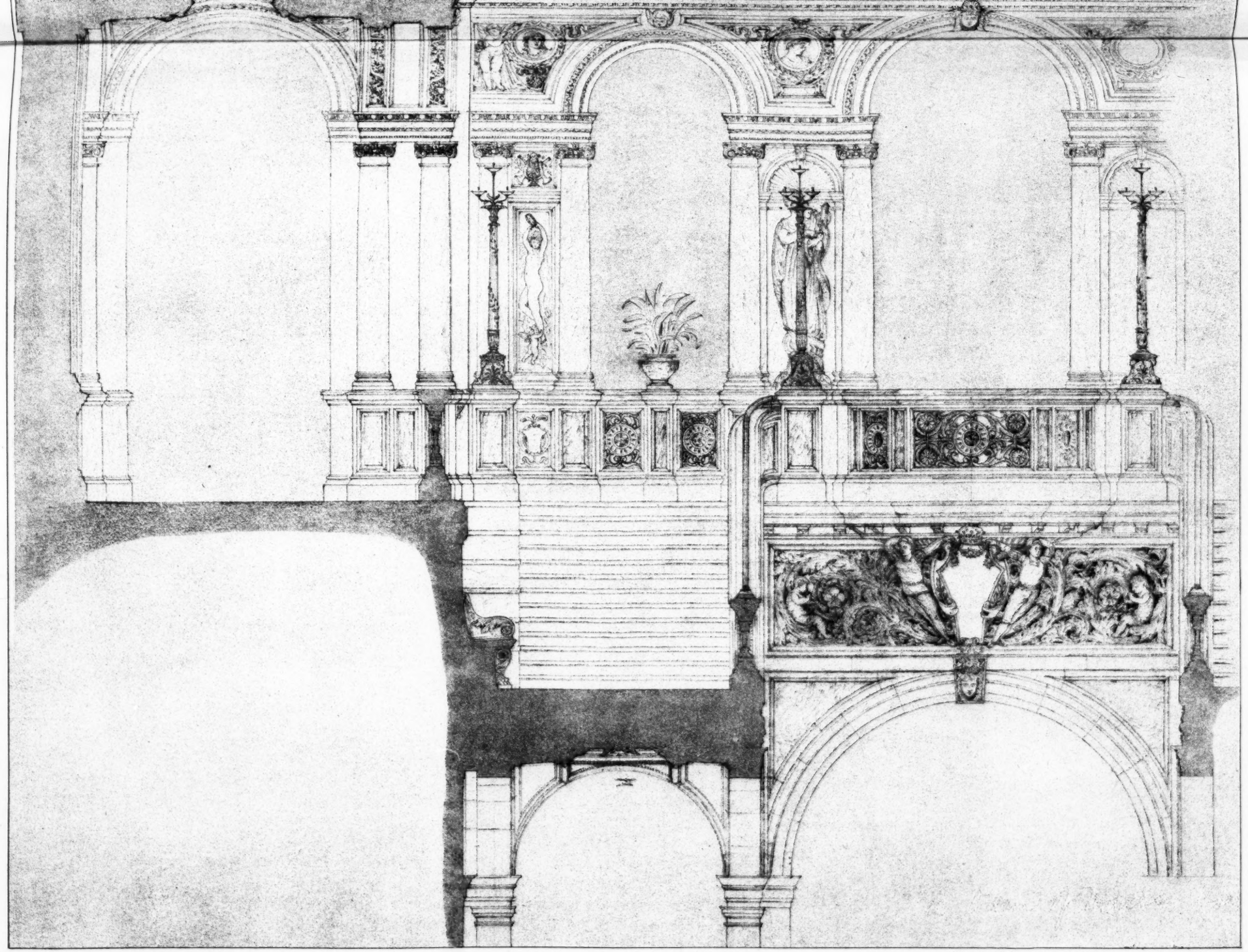
Tite Prize, R.I.B.A., 1891.

DESIGN FOR STAIRCASE FOR A LARGE TOWN MANSION.

BY MR. A. MACKINTOSH.

CROSS SECTION SHEWING DETAIL.





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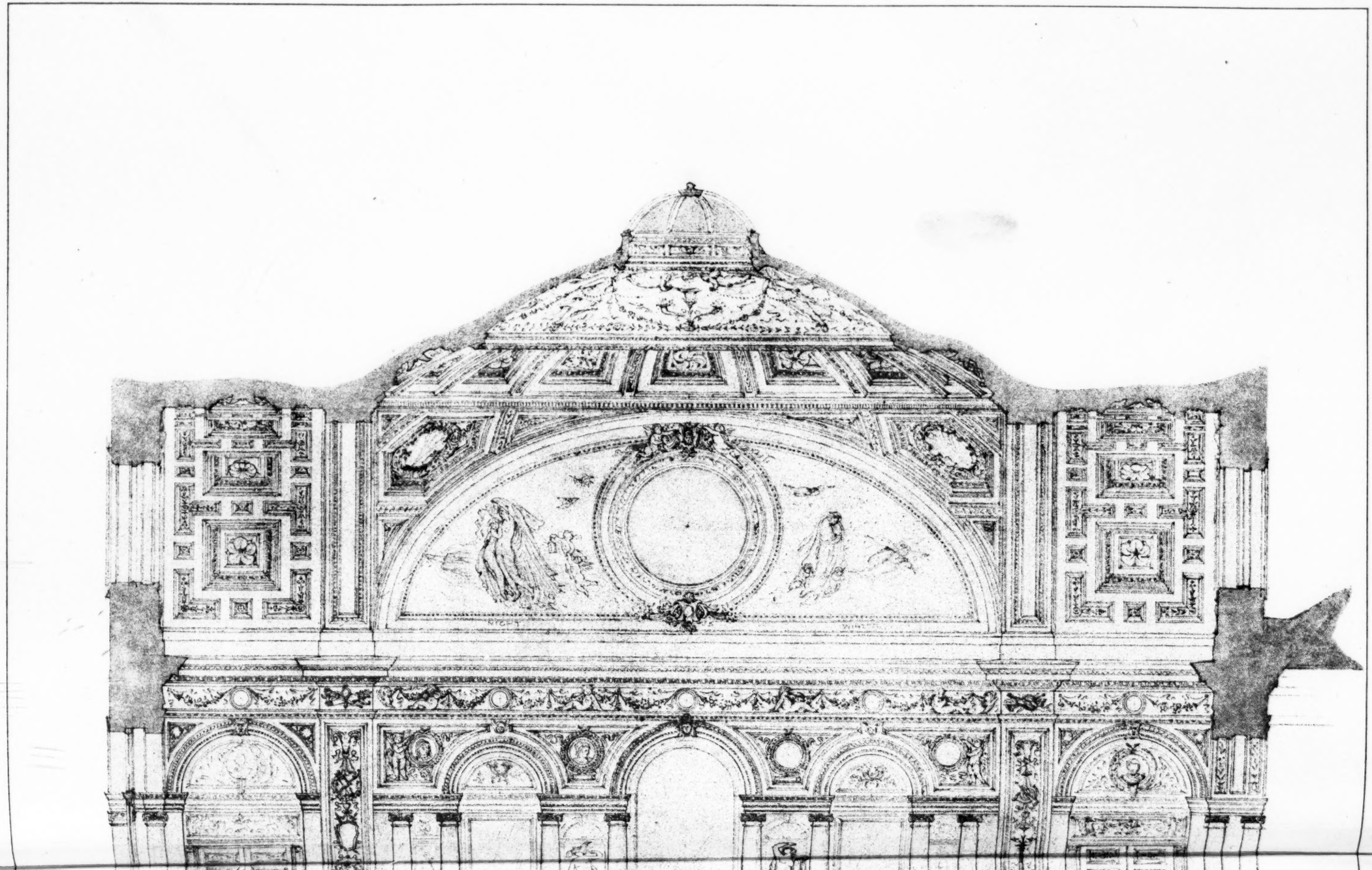
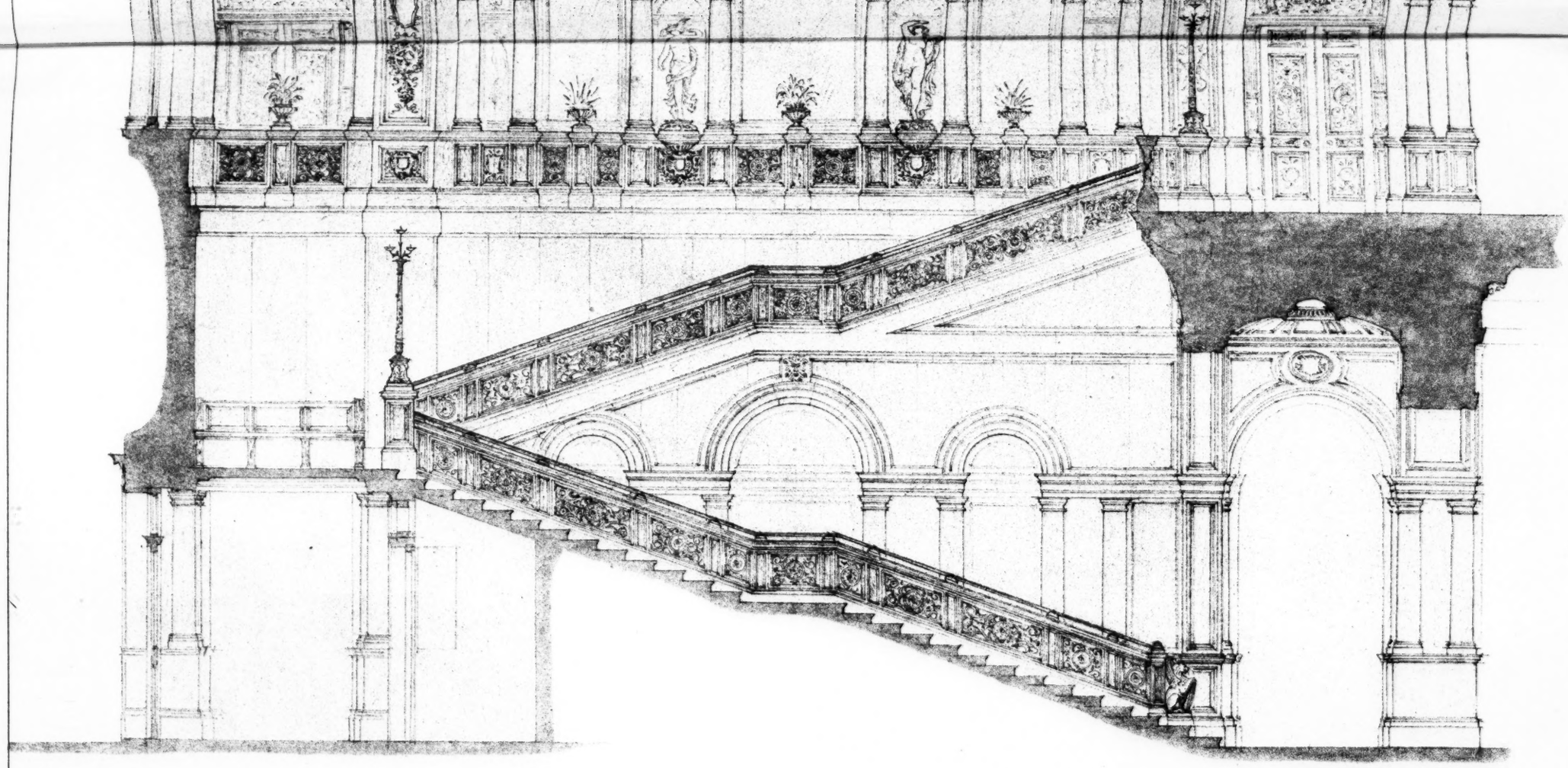
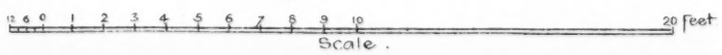




DESIGN FOR STAIRCASE FOR A LARGE TOWN MANSION.

BY MR. A. MACKINTOSH.

LONGITUDINAL SECTION.



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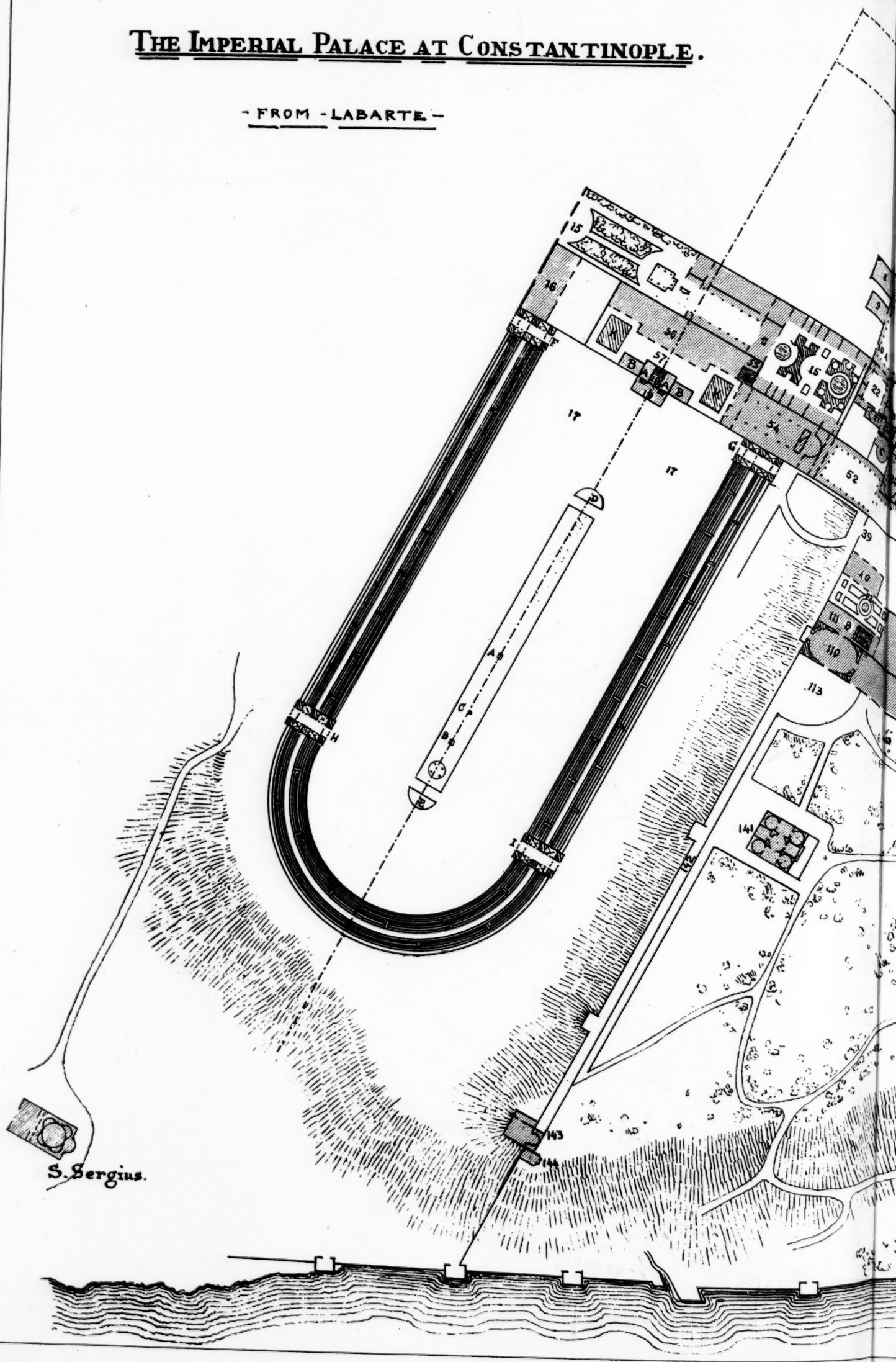
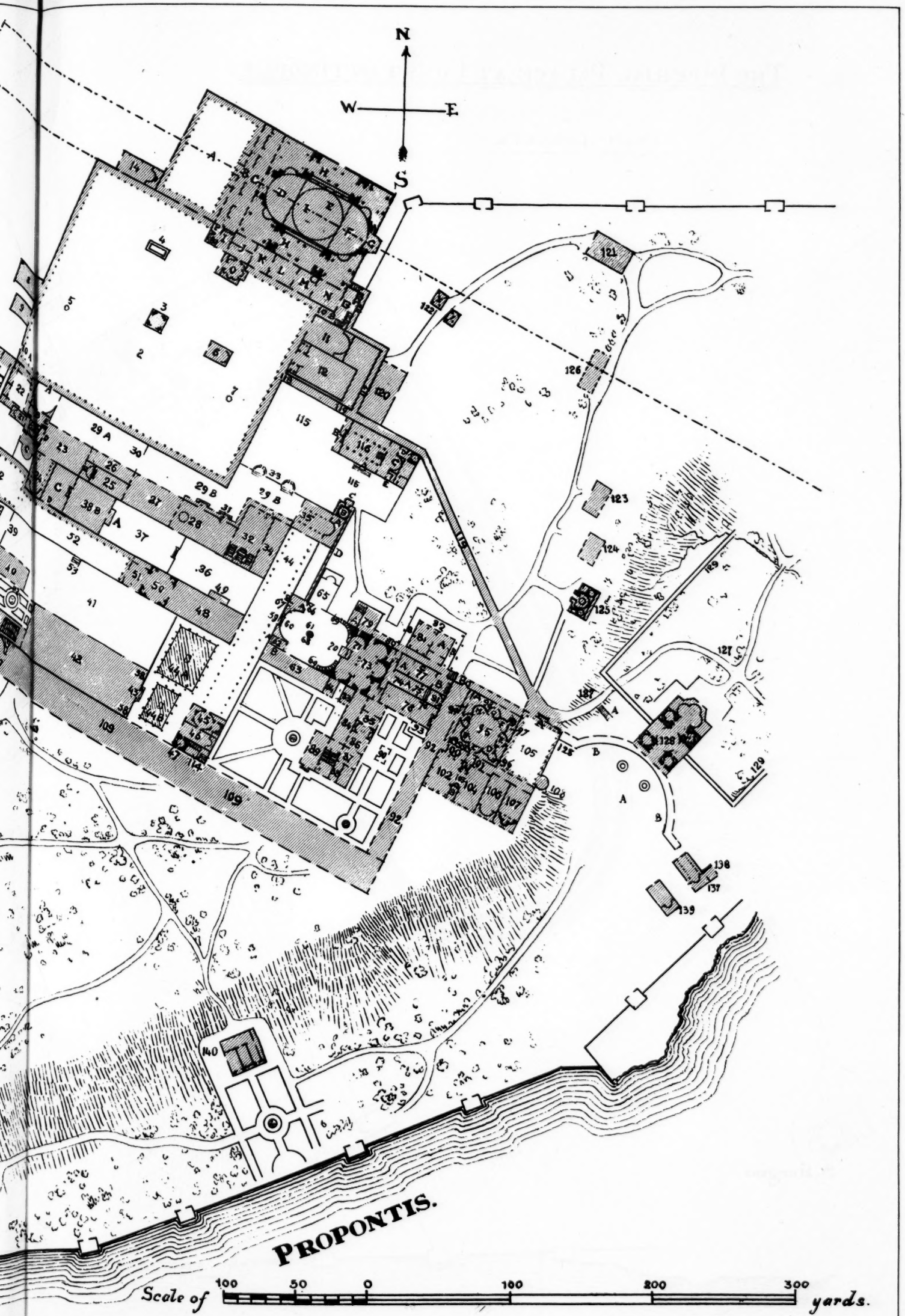
THE IMPERIAL PALACE AT CONSTANTINOPLE.

- FROM - LABARTE -





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